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# Perceptions of positive and negative factors influencing the attractiveness of PPP/PFI procurement for construction projects in the UK

PPP/PFI  
procurement

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## Findings from a questionnaire survey

Bing Li and A. Akintoye

*School of the Built and Natural Environment, Glasgow Caledonian University,  
Glasgow, UK*

P.J. Edwards

*School of Property, Construction and Project Management, RMIT University,  
Melbourne, Australia, and*

C. Hardcastle

*School of the Built and Natural Environment, Glasgow Caledonian University,  
Glasgow, UK*

### Abstract

**Purpose** – The paper aims to report the findings of research into perceptions of what makes the Private Finance Initiative (PFI) attractive or unattractive as a procurement system for projects in the UK.

**Design/methodology/approach** – The research uses a postal survey questionnaire technique for primary data collection. Literature review is used to identify relevant factors, which are then incorporated into the design of the survey instrument. Survey response data is subjected to descriptive statistical analysis and subsequently to rotated factor analysis.

**Findings** – Public/private partnerships (PPP)/PFI project procurement is perceived as most attractive in terms of positive factors relating to better project technology and economy, greater public benefit, public sector avoidance of regulatory and financial constraints, and public sector saving in transaction costs. Negative aspects, relating to factors such as the inexperience of the participants, the over-commercialisation of projects, and high participation cost and time, make PPP/PFI procurement less attractive.

**Originality/value** – The procurement of public facilities and services under arrangements involving partnerships between the public and private sectors is claimed to provide a wide variety of net benefits to the public sector and to the private sector participants. In the project development process, the parties have to make decisions based on suitable evaluation criteria. At the early stage of preparing a business case, a clear and common understanding of the positive and negative factors surrounding PPP/PFI procurement will provide a more informed basis for decision making.

**Keywords** Private finance, Procurement, Construction industry, Factor analysis, United Kingdom

**Paper type** Research paper

P.J. Edwards is currently Leverhulme Trust Visiting Fellow in the School of the Built and Natural Environment, Glasgow Caledonian University, Glasgow, UK.



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### Introduction

In the UK, public/private partnerships (PPP), in the guise of the Private Finance Initiative (PFI), have become an integral part of national government policy in the delivery of public facilities and services (HM Treasury, 2000).

Despite the increasing use of PFI and other PPP schemes in the UK, there are still aspects of PPP/PFI which are not clear to all of the participants. The Institute of Public Policy Research (IPPR) collected "evidence calling for Public Private Partnerships" across the UK in 2000 (Institute for Public Policy Research, 2000a). The aim of the IPPR survey was to produce a set of authoritative guidelines which would inform the use of such partnership arrangements in future public policy. A similar understanding is required for PPP/PFI construction projects. To this end, survey research has been carried out which focuses particularly on the positive and negative factors that make the adoption of PPP/PFI procurement more, or less, attractive to the public and private sector parties involved in construction projects. The purpose of this paper is to report on the findings of this survey.

### General perceptions of PPP/PFI

Public and private sector response to PPP/PFI has so far been mixed in the UK and overseas. Some participants actively welcome the policy (Allen, 1999; Middleton, 2000). Other reactions have been largely negative (Owen and Merna, 1997). Complimentary reviews about PPP/PFI note the benefits it brings about in terms of its effect on economic development strategy. PPP/PFI procurement allows government and the private sector to learn from each other and create synergistic effects for both parties. It is even claimed that PPP/PFIs will become a cornerstone of the current UK Labour Government's modernisation programme, through the delivery of better quality public services, by bringing in new investment and improved management; and will provide a major boost to the construction industry (HM Treasury, 2000).

Critics, on the other hand, suggest that PPP/PFI/PFI is a controversial and problematic approach to capital development in the public sector (Ruane, 2000). In the UK, the trade unions, especially UNISON, have been trenchant critics of PPP/PFI and call for re-nationalisation, particularly for UK rail transport systems.

These contrasting perceptions of the attractiveness of PPP/PFI (as a means of delivering public facilities and services) complicate the task of decision makers involved in preparing the business case for a PPP/PFI project. They can also influence policy development for public sector project procurement generally. While some aspects of PPP/PFI projects will clearly make them more attractive to one stakeholder than to another, it should be possible to explore the concept of attractiveness at greater depth. This is done by first expounding the factors that may positively and negatively influence the attractiveness of PPP/PFI projects, and then testing these against the perceptions of project participants.

#### *Positive PPP/PFI attractiveness factors*

The transfer of risk is a primary objective in PPP/PFI project procurement. The public sector partner seeks to divest itself of the risks associated with the delivery and operation of desired public facilities and services. Many of these risks relate to the time, cost and quality objectives of projects. Will the project be completed on time? Will it be completed according to budget? Will it be fit for its intended purpose? While risk

transfer may be an obvious positive feature of PPP/PFI for the public sector, it is less clear how private sector parties might also share this view. However, under current guidelines in the UK, the public client provides explicit information about risk allocation to confirmed private sector bidders during the contract procurement process for a project (national audit Office, 1999; National Health Service, 1999). Since this must yield greater clarity about project risk, it is likely that the private sector would agree that risk transfer is also a positive factor in its participation in PPP/PFI. The fact that risk and reward go hand in hand also suggests that private sector participants may be enthusiastic about securing opportunities to profit from the risk transfer that occurs.

Traditional public provision sector responsibility for the delivery of public facilities and services inevitably carries with it the image of a bottomless purse in action. Regardless of unforeseen increases in the capital costs of projects, or higher than expected ongoing service delivery and maintenance costs, it is expected that money will be available to resolve matters. PPP/PFI corrects this image, since it subjects capital expenditure decisions to the ruthless scrutiny of private sector commercial practice. Furthermore, the public sector partner is able to cap its final service costs at pre-determined levels through the concessional agreement made with its private sector counterpart (Tiong and Anderson, 2003).

In addition to gaining the capacity to cap final service costs, the public sector in PPP/PFI should be able to substantially reduce administration costs, since it will no longer have day-to-day responsibility for service delivery. Instead, the public client takes on a less intensive role of monitoring the performance of the private concessionaire and receiving periodic reports (Bennett, 1998).

PPP/PFI reduces the amount of public money tied up in capital investment since it relieves government of a substantial proportion of public debt. It also slows unsustainable growth in the acquisition and maintenance of public assets that would otherwise occur at the expense of compromising the delivery of essential services (Jones *et al.*, 1996).

Private sector involvement in public service provision means that the private investment tackles the problem of bottlenecks in infrastructure demand and supply. Even in some wealthy European Union countries, for the purpose of ensuring that the general government deficit is not more than 3 per cent of Gross Domestic Product (GDP) and gross public sector debt not more than 60 per cent of GDP, governments are forced to consider other sources of investment. The public liabilities involved in PFI projects do not appear as public sector borrowing in annual financial reporting, in the sense that the loans are taken out by private sector companies. By contrast, when public sector bodies borrow for investment purposes, the full value of the capital raised counts towards the public sector borrowing and other measures of government deficit. The "off balance sheet" accounting possibilities offered by PPP/PFI are therefore attractive to financial administrators in the public sector. The exemption of PFI transactions from the public sector borrowing requirements isolates such schemes from centrally controlled budgetary allocations and the usual cash limits that accompany public sector expenditure (Akintoye *et al.*, 2001).

PPP/PFI procurement is seen as attractive to public and private sector participants because it forces a project to service any financial debt from the revenue streams derived from the project itself. There is no recourse to public funding, nor can the debt be secured by the underlying asset value since for most projects ownership reverts to

the public client after a pre-determined period. The revenue streams may comprise fees paid directly to the concessionaire by users (e.g. toll road fees), or fees paid by government on behalf of all potential users (e.g. fees per hospital patient serviced, or per school pupil accommodated). This non-recourse or limited recourse public funding is an important ingredient of PPP/PFI procurement (Carrick, 2000; Akintoye *et al.*, 2001).

128 It is thought that, since PPP/PFI approaches encourage private sector commercial efficiency to replace public sector bureaucratic inefficiency, it is reasonable to expect that total project cost can be reduced (Hambros, 1999).

An attractive feature of PPP/PFI procurement method is that it offers both the public client and the private contractor more freedom to select innovative methods in the provision of assets and services. This should lead to time saving by accelerating project development and by avoiding delays in project delivery (Downer and Porter, 1992; Hall, 1998; Utt, 1999).

By taking over the responsibility for design, construction, operation and maintenance, private contractors have to consider design suitability and convenience for future construction and operation practice, by placing emphasis on improving the buildability and maintainability of projects (Hambros, 1999).

With PPP/PFI procurement, the project scope is capable of expansion to reflect a broader context. This might permit the development of an integrated solution, such as binding several small projects formerly dealt with under different departments (for example: a school, library, and recreation centre) into a single project, thus achieving economies of scale (Utt, 1999; Government of Nova Scotia, 2000).

PPP/PFI is seen as attractive in terms of the potential benefits it may bring to local economic development in the region(s) where the facility is built or the services are delivered. Local employment opportunities are enhanced, not only for the direct construction and operational activities associated with the project, but also for ancillary services and businesses established by entrepreneurs eager to exploit the opportunities created by its location (National Audit Office, 2001).

Internationally, and particularly in developing countries, PPP/PFI is seen as attractive in terms of its capacity to achieve the transfer of technological knowledge to local enterprises. Project procurement is arranged so that private sector partners with the desired technological expertise from more developed nations are enticed into joint venture type agreements with local companies (Nielsen, 1997; Trim, 2001).

#### *Negative PPP/PFI attractiveness factors*

A lack of PPP/PFI experience and appropriate skills exists not only in the public sector but also in the private sector. Public project developments under the concept of PPP/PFI are quite new, especially in core public services areas such as schools and hospitals. The concept of PPP is comparatively less well understood in countries with a strong public welfare policy; and even more so in terms of operational service delivery. Regulatory policy in this area may be very strict concerning public finance and expenditure. In such countries, governments have less experience in alternative ways to finance their projects. The lack of understanding and the need for better training by public officials involved in PPP/PFI projects is a major issue identified by Morledge and Owen (1998). The private sector also lacks appropriate skills in PPP/PFI projects (Ezulike *et al.*, 1997). Financing, operating, maintaining and investing in a long-term

asset are not familiar activities to construction contractors. For example, a short while after the facility opened, the concessionaire for a toll road project in Australia experienced a breach of security in its electronic tolling system for the credit card account details of several thousand customers. The ensuing publicity reflected adversely on the competence of the concessionaire and its state government partner in the BOOT project.

In the toll road project example noted above, the concession deed allows the private operator to increase tolls every six months by an amount based upon a capped limit to the prevailing inflation rate. This substantially protects the operator's real income, and further protection (by way of minimising any fall-off in traffic volumes for the toll road) was entrenched in the deed by removing clear-way restrictions on local roads in the vicinity. The removal of clearway restrictions on local roads increased the amount of parking on them, consequently slowing traffic and thus discouraging "rat-run" behaviour by motorists trying to find alternative routes to the toll-way. Additionally, adjoining local authorities were barred (by the state) from undertaking road improvements that could directly impact adversely on the toll road traffic volumes. Effectively, therefore, the revenue streams of the private concessionaire have been protected at the cost of greater traffic inefficiencies in adjoining areas. In this situation, the "user pays" principle has been partly subverted by a "non-user also pays" effect, although neighbouring localities have anecdotally reported lower overall traffic volumes on local roads. Under a traditional wholly public sector procurement approach, the project would probably have been undertaken on a toll-free basis with a combination of federal and state funding, and public borrowing, with loan repayments made from general tax revenues. Even if tolls had been imposed in a public scheme, it is doubtful that they would have been allowed to escalate every six months. Effectively, therefore, the PPP arrangement in this case has resulted in higher direct charges to the users. However, this is clearly not a simple conclusion to be drawn in every instance.

At the present time there is no standard contract in the UK for PPP/PFI projects. Procurement relies on HM Treasury's Project Review Group criteria or National Audit Office best practice guidance (National Audit Office, 1999), which require a great deal of work for an individual project operation. Most PPP/PFI projects cover not only the design and construction of the project, but also operation and concessionary ownership over a long-term period. The complexity of project requirements results in high participation costs to interested private sector parties. Birnie (1999) discovered that the cost of tendering for PFI projects in the UK is considerably higher than for other procurement systems. Furthermore, there is no apparent reduction in participation costs for a commensurate increase in the scale of the works. Other costs associated with PPP/PFI bids include the cost of assembling and setting up a consortium, and the cost of investing equity in the corresponding business entity that is created (Ezulike *et al.*, 1997). Under current UK government guidelines, it is considered that the cost of developing a PPP/PFI project can be higher than that of an equivalent publicly funded approach (Saunders, 1998).

The above factors themselves give rise to others that negatively affect the attractiveness of PPP/PFI projects. Lack of critical experience, coupled with high participation costs, mean that participation to date in such schemes has been restricted to relatively few private sector partners. Grimsey and Graham (1997) have noted

problems with complexity and affordability. Currently, it is likely that too many scheme proposals are chasing too few private players (Public Services Privatization Research Unit, 2000). The nature of PPP/PFI, with its emphasis on complex, large scale long term projects and substantial elements of risk transfer, means that a mature and sufficient private sector market has not yet been established, at least in the UK. Despite the capacity to form project consortia, there are comparatively few private sector organisations, with sufficient confidence in their own ability to make them successful, capable of taking on such projects. In turn, this restricted participation has resulted in fewer schemes reaching the contract stage (Public Services Privatization Research Unit, 2000).

As yet there is little reliable evidence that a situation over-reliance on the private sector is beginning to occur in the provision of public facilities and services. However, there must be a chance that the private sector partner in a project will fail, leaving the public client to pick up the pieces and maintain essential service delivery. In 2003, an international transport conglomerate, a concessionaire for privatised delivery of public rail services in Victoria, Australia, walked away from its obligations at very short notice, leaving the state government to resume the public responsibility that, through privatisation policies, it had managed to divest itself from some six years previously. Despite substantial experience with PPP, it took over a year for the Government to form a new partnership with another private sector company that was already operating another section of the same rail system. The vaunted competitiveness of privatisation was thereby weakened.

A PPP/PFI project is normally proposed in order to achieve several objectives. In the UK, the Government uses the PFI and other types of PPP to complement additional public sector investment and to ensure that genuine economic benefits are shared between the public and private sectors. It is possible for conflicting objectives to arise and cause confusion in terms of their assessment criteria for both private contractor and public participants. Many advisors (specialists, lawyers, and financiers) are involved in the evaluation of PPP/PFI projects. The evaluation criteria are often very diverse. Any confusion will affect the ability of all the parties to operate efficiently.

Although the contrary was suggested earlier as a positive factor, it has been argued that some PPP/PFI projects have had a higher project cost than comparable projects delivered under traditional procurement. The cost of a PFI/PPP/PFI project itself is claimed to be generally higher than the comparable public sector facility provision through traditional procurement (Ezulike *et al.*, 1997; Birnie, 1999). High project cost might have been caused by the private sector adding a larger profit margin to cover unfamiliar risks, and such premiums may subside as experience is gained. Public Services Privatization Research Unit (2000) claims that PFI costs more than conventional procurement, since the private sector could not borrow capital to finance projects as cheaply as the public sector. This suggests that private finance organisations have taken a more pessimistic risk view. The Public Services Privatization Research Unit (2000) also notes that escalating costs are common in PFI schemes, due to open-ended contracts. For example, the first large-scale hospital contract in Norfolk is said to be currently worth £193 million, compared to £90 million at its start-up time.

Some PPP/PFI projects are the subject of lengthy political debate before they go to tender, causing further delay in their execution. The London Underground PPP/PFI

project, where conflict arose between the London Lord Mayor and the central government, is an example (Infrastructure Journal, 2001a). UK Members of Parliament joined forces to demand that the National Audit Office (NAO) took a fresh look at the PPP/PFI arrangement before contracts with private companies were signed. The Liberal Democrat party urged the Parliamentary Public Accounts Committee to order an NAO investigation. The NAO was mandated to decide whether PPP/PFI meets the key value-for-money criteria over other means of funding, such as the public bonds scheme favoured by London Lord Mayor, Ken Livingstone, and Bob Kiley (Infrastructure Journal, 2001b). Political debate may also extend beyond the project tender. In New South Wales, Australia, planning and decision making for a motorway project dragged on for nearly one and a half decades. When construction on the PPP project finally commenced, the State Government was forced to deal with the environmental concerns of community groups that were being led and co-ordinated by a group whose advocacy for public transport alternatives continued to show up in anti-motorway messages and lobbies.

PPP/PFI imposes a new and more complex procurement process on the public sector. It is part tendering and part contract negotiation among public bodies, private sector consortia and their advisers. Ezulike *et al.* (1997) found that there is an extensive amount of time used in contract transactions such as bidding for PPP/PFI projects, coupled with much negotiation time between the public sector client, its project advisers, and the private sector consortia and their advisors, over the terms and conditions of the contract.

Critics of PPP/PFI believe that it reduces project accountability (Infrastructure Journal, 2001b; Pollock and Vickers, 2001). In contrast with the transparent accountability of virtually all public sector projects procured under traditional procurement arrangements in westernised democracies, information disclosure and reporting requirements for many PPP/PFI projects must at best be regarded as patchy. As part of the contract agreements, a great deal of information is treated as "commercial-in-confidence". Not only does this remove it from public scrutiny, it also protects it from the exercise of disclosure powers under freedom of information legislation. Although the public and private partners in some projects proclaim their "openness" with extensive web-publication of information, in reality this more often than not comprises truncated extracts of documents, with much of the sensitive detail excised. Project accountability under traditional forms of public sector procurement is usually a straightforward application of public audit procedures carried out under administrative terms of reference that have been established through democratic processes of legislation. It is possible for PPP/PFI procurement to avoid such procedures. Performance reporting for most PPP/PFI projects is limited to what has been agreed beforehand between the parties. If reporting on particular matters (e.g. evolving environmental issues, or emerging trends in use patterns) is not required by the contract, it is difficult, if not impossible, for the public sector partner to subsequently demand such information. In traditional public procurement no such difficulty arises.

Another contradiction with a positive factor proposed earlier is that PPP/PFI may result in fewer employment opportunities in the local area (Public services Privatization Research Unit, 2000). The shift in responsibility for provision and delivery of public facilities and services, from the public sector to the private sector,

does not automatically mean that all public sector staff previously employed dealing with them will then take up opportunities to continue their work with the new private sector partners. Economics does not work this way in practice. Any shrinkage in the size of public bureaucracies is unlikely to be matched by parallel growth in private sector employment opportunities. The former will occur far too slowly, while the latter will be subject to the cost saving, efficiency and productivity expectations of the private sector.

*Summary*

The positive and negative features that influence the attractiveness of PPP/PFI in the delivery of public facilities and services are summarised below.

Positive factors include:

- Transfers risk to the private partner.
- Caps the final service costs.
- Reduces public sector administration costs.
- Reduces public money tied up in capital investment.
- Solves the problem of public sector budget restraint (Akintoye *et al.*, 2001).
- Non-recourse or limited recourse public funding.
- Reduces the total project cost.
- Improves buildability.
- Accelerates project development.
- Saves time in delivering the project.
- Improves maintainability.
- Benefits local economic development (HM Treasury, 2000).
- Transfers technology to local enterprises.
- Facilitates creative and innovative approaches (Birnle, 1999; Government of Nova Scotia, 2000).
- Enhances government integrated solution capacity (Sohail, 2000).

Negative factors include:

- Few schemes reach the contract stage.
- Threatened by lack of experience and appropriate skills (Morledge and Owen, 1998; Ezulike *et al.*, 1997).
- Leads to higher direct charges to users.
- Imposes excessive restriction on participation.
- High participation costs are incurred (Ezulike *et al.*, 1997; Saunders, 1998; Birnle, 1999).
- High risk relying on private sector.
- Confusion can arise over government objectives and evaluation criteria.
- May lead to high project costs (Ezulike *et al.*, 1997; Birnle, 1999; Public Services Privatization Research Unit, 2000).



- Lengthy delays caused by political debate (*Infrastructure Journal*, 2001a, b).
- Much management time is spent in contract transaction (Ezulike *et al.*, 1997).
- Lengthy delays can arise in negotiation.
- Reduces project accountability.
- Offers fewer employment opportunities.

The issue to be explored is the relative importance of each of these factors in terms of the perceptions of participants in PPP/PFI construction projects. This issue was investigated through opinion survey research carried out in the UK.

### Research survey design and administration

A questionnaire survey was conducted in 2001. Survey targets were limited to the available information listing those with PFI experiences or expressed interests in PPP/PFI. The sampling technique used for data collection for this survey was a convenience sample, rather than random sampling, because there is no comprehensive, nor any standard, database of UK organisations involved in PPP/PFI projects. In addition, PPP/PFI procurement is evolving and, as a result of this, the number of organisations involved is growing, but not in a form whereby their population can readily be determined. Random sampling demands that the organisations involved are sufficiently well distributed and the population is known (Diekhoff, 1992, Fellows and Liu, 1997). Neither of these conditions can be met in current PPP/PFI research.

The questionnaire was pilot tested to ensure that it was practical. The initial draft was presented to the PFI research group at Glasgow Caledonian University. A further pilot study was administered to Carillion Services Ltd, which is active in PFI projects.

The final questionnaire comprises three parts. The first part seeks background information about the respondents and their organisations. The second part deals with general issues about PPP/PFI projects. The third part investigates risk and risk management within PPP/PFI projects. This paper reports one of the special issues of Part Two – positive and negative factors influencing the attractiveness of PPP/PFI as a preferred procurement approach (see lists above for the variables included in the questionnaire). Likert style rating questions, using a five-point scale, were used to elicit respondents' opinions of the importance of each nominated variable. The scale intervals are interpreted as follows:

- (1) Not important.
- (2) Fairly important.
- (3) Important.
- (4) Very important.
- (5) Extremely important.

A zero option was also offered to filter any variable that respondents thought was not relevant to the attractiveness of PPP/PFI, and zero scores were discarded in the data analysis.

A total of 500 questionnaires were sent out to establishments known to have had involvement in PPP/PFI projects. A total of 61 completely filled questionnaires were returned, comprising 16 public sector and 45 private sector respondents. The effective return rate (12 per cent) was higher than that of earlier PPP survey research which

achieved a response rate of 9.6 per cent (Institute for Public Policy Research, 2000b), and is comparable with other survey research in construction and project management. The response was therefore deemed adequate for the purposes of data analysis.

Of note in the survey response demographics was the relatively high proportion of central government involvement in PPP/PFI, compared with regional and lower level public sector entities. This suggests that useful PPP/PFI learning/skills transfer could be offered by central government. The survey responses also revealed a substantial multi-role involvement on the part of private sector organisations, with a common contractor role evident in all combinations. This suggests that a strong culture of role diversity is now developing in the UK construction industry. All the respondents were either directors or managers in their respective organisations. Table I indicates the roles undertaken by the survey respondents in PPP projects. Table II shows the PFI/PPP project types reflected in respondents' experience.

Sector	Role	Frequency	Percent
Public	Central government	9	56.25
	Local government	4	25
	Government agency	2	12.5
	Public enterprise	1	6.25
	Subtotal	16	100
Private	Financier	2	4.44
	Main contractor and designer	5	11.11
	Designer	3	6.67
	Constructor	2	4.44
	Consultant/advisor	16	35.55
	Operator	1	2.22
	Supplier	1	2.22
	Financier and main contractor and designer	3	6.67
	Financier, main contractor and operator	5	11.11
	Financier, main/subcontractor and operator	1	2.22
	Financier, constructor, consultant and operator	1	2.22
	Main contractor, consultant	1	2.22
	Main contractor and operator	3	6.67
	No indication	1	2.22
	Subtotal	45	100

**Table I.**  
Survey respondents' roles  
in PFI/ PPP Projects

Project type	Public sector (n)	Per cent	Private sector (n)	Per cent
Hospital	1	4.3	29	18.2
Transportation	6	26.1	21	13.2
Water and sanitary	1	4.3	9	5.7
Power and energy	2	8.7	6	3.8
IT and communication	4	17.4	2	1.3
Housing and office	5	21.7	15	9.4
Defence and military	0	0.0	18	11.3
Police and prison	2	8.7	19	11.9
School and education	1	4.3	34	21.4
Others	1	4.3	6	3.8

**Table II.**  
PPP/PFI project types  
reflected in survey  
respondents' experience

## Survey results

### *Data consistency*

Reliability analysis was conducted to test the internal consistency of the survey variable data. Cronbach's Alphas are 0.821 ( $F$ -statistic = 9.757, Sig. = 0.000) for "positive" factors, and 0.888 ( $F$ -statistic = 26.602) for "negative" factors. Both of them are much higher than the 0.70 of Nunnally's (1978) guideline which suggests that, in the early stages of research on predict tests or hypothesised measures of a construct, reliability of 0.70 or higher should suffice.

It should be noted that the data recorded respondents' opinions about the importance of each factor variable. The statistics thus reflect pooled subjective views. Although these are not objective measures, internal data validity is enhanced by the demographics of the response sample, which show that the average construction project experience of the respondents is just over 21 years, and that more than 50 per cent of them recorded over 20 years of experience.

For the most part, reporting of the data analysis, for both the descriptive statistics and the rotated factor analysis, is based upon the total sample response. This is based upon the view that the analysis could not be certain that respondents were consistently recording opinions that represented only their side of the PPP/PFI picture; for example, that central government respondents were only reflecting the perceived attractiveness of PPP/PFI arrangements to the government. Where statistically significant differences were found between the public and private sector responses, these results are discussed separately.

### *Ranking of positive attractiveness factors for adopting PPP/PFI project procurement*

The survey rankings of respondents' opinions of the attractiveness factors of PPP/PFI are listed in Table III. For the 15 factors offered to respondents, the mean response rating values (for all respondents) range from 3.98 (risk transfer) down to 1.82 (technology transfer). No factor mean value scores fell into the "extremely important" ( $>4.50$ ) and "not important" ( $<1.5$ ) categories. This may be due more to natural inclination on the part of respondents to avoid extremes of subjective opinion, than to the categorical absence of any extremely important or unimportant factors. Their scoring absence simply suggests that the five-point Likert scale was probably attempting to measure differences in opinion that were too subtle at the extremes, and dose not invalidate the distinctions that were found.

*Very important (mean score: 3.51-4.50).* The transfer of risk to private sector (Table III: mean value 3.98) is the primary objective of the public sector in the introduction of PPP/PFI for public project development. This result could therefore have been anticipated from public sector survey respondents. The similar result from private sector respondents is more difficult to explain, but may be due to the greater clarity of risk allocation offered by PPP/PFI procurement.

The problem of public sector budget restraint (Table III: mean value 3.86) besets many municipal and other public sector authorities, especially in terms of improving public infrastructure and delivering essential services. Clearly, the attractiveness of PPP/PFI in addressing this problem is fully recognised by both public and private sector stakeholders.

*Important (mean score: 2.51-3.50).* An attractive feature of PPP/PFI procurement method is that it offers both the public client and the private contractor more freedom

Factor	Public sector		Private sector			All respondents		
	Mean	Rank	Mean	Rank	Mean	Rank	F	Sig.
Transfer of risk to the private partner	3.75	2	4.07	1	3.98	1	1.464	0.231
Solves the problem of public sector budget restraint	3.81	1	3.88	2	3.86	2	0.035	0.853
Non recourse or limited recourse public funding	3.00	5	3.85	4	3.61	3	0.987	0.325
Reduces public money tied up in capital investment	2.75	9	3.88	3	3.58	4	10.493	0.002*
Caps the final service costs	3.25	3	3.67	5	3.56	5	1.802	0.185
Improves maintainability	2.88	7	3.53	6	3.36	6	3.598	0.063
Facilitates creative and innovative approaches	3.19	4	3.42	7	3.36	7	0.359	0.551
Enhances government integrated solution capacity	2.81	8	3.14	9	3.05	8	0.744	0.392
Improves buildability	2.50	10	3.23	8	3.03	9	4.592	0.036*
Reduces the total project cost	2.94	6	2.98	12	2.97	10	0.008	0.929
Accelerates project development	2.47	11	3.12	10	2.95	11	2.302	0.135
Saves time in delivering the project	2.06	13	3.00	11	2.75	12	5.266	0.025*
Benefit to local economic development	2.13	12	2.79	13	2.62	13	2.962	0.091
Reduces public sector administration costs	2.00	14	2.72	14	2.53	14	3.239	0.077
Technology transfer to local enterprise	1.50	15	1.93	15	1.82	15	1.266	0.266

**Table III.**  
Survey respondents' ranking of positive factors for PPP/PFI procurement

to select innovative methods (Table III: mean value 3.36) in the provision of assets and services. However, recognition of the inherent risks and practical limitations of innovation has probably kept this factor from being scored more highly.

The presence of factors such as buildability (Table III: mean value 3.03) and maintainability (Table III: mean value 3.36) in this band suggests that these factors may be aligned with innovation in terms of their risk and practicality elements. The opportunity for the private sector to inject its technical expertise much earlier in the project development process is clearly regarded as an attractive feature of PPP/PFI by both parties. Given the comparatively short history of PPP/PFI, it is less easy to explain why project maintainability might be regarded as even more attractive under such schemes, unless the life-cycle links between construction and maintenance are substantially acknowledged.

The achievement of economies of scale, by developing an integrated solution (Table III: mean value 3.05) is seen as an important and attractive opportunity to broaden the context of PPP/PFI to include projects that might otherwise not be considered as suitable for this type of procurement.

Two factor rankings: reduce the total project cost (Table III: mean value 2.97) and accelerate project development (Table III: mean value: 2.95) show that the potential to

deliver cheaper projects in shorter time is still regarded as an attractive possibility in PPP/PFI procurement, by both public and private sectors. This is despite the contrary research evidence noted earlier in this paper, and thus suggests that further research into the pre-operational performance of PPP/PFI schemes is essential.

The factor, benefit to local economic development (Table III: mean value 2.62), is determined by government policy and is rarely correlative to an individual project. Furthermore, accurate measurement of benefits achieved is difficult over most of the criteria used to define economic development. Nevertheless, it appears that both partners in PPP/PFI are aware of the need for their projects to demonstrate tangible economic benefits to the areas in which they are located.

*Fairly important (mean score: 1.51-2.50).* Only one factor, transfer of technology to local enterprises (Table III: mean value 1.82), appeared in this band. In a developed economy such as the UK, it might have been anticipated that this factor would have scored even less. However, the capacity of some types of projects to lift or change the levels of technological expertise in local areas should not be overlooked, particularly in regions where high unemployment has resulted from the decline and obsolescence of older technologies.

#### *Ranking of negative factors associated with PPP/PFI project procurement*

Rankings of the negative aspects associated with the attractiveness of PPP/PFI arrangements were produced from the survey data, with mean rating values (for all respondents) ranging from 3.86 down to 1.71 (Table IV). Discussion on some of these follows here. No factor mean value scores fell into the "extremely important" (> 4.50) and "not important" (< 1.50) bands.

*Very important (mean score: 3.51-4.50).* The time taken up with contract transactions (Table IV: mean value 3.86) and negotiation time (Table IV: mean value

Factor	Public sector		Private sector		All respondents			Sig.
	Mean	Rank	Mean	Rank	Mean	Rank	F	
Much management time in contract transaction	3.94	1	3.83	1	3.86	1	0.133	0.716
Lengthy delays in negotiation	3.38	2	3.79	2	3.68	2	1.534	0.221
High participation costs	3.31	3	3.60	3	3.53	3	0.558	0.458
Confusion over government objectives and evaluation criteria	2.40	7	2.95	4	2.81	4	1.473	0.230
Lack of experience and appropriate skills	2.69	4	2.81	5	2.78	5	0.082	0.776
Lengthy delays caused by political debate	2.20	9	2.58	6	2.48	6	0.737	0.394
High project costs	2.47	6	2.42	8	2.43	7	0.015	0.902
Higher direct charges to users	2.53	5	2.26	9	2.33	8	0.414	0.523
Excessive restriction on participation	1.80	12	2.50	7	2.32	9	2.241	0.140
High risk relying on private sector	2.25	8	2.21	10	2.22	10	0.010	0.921
Reduces project accountability	2.06	10	1.83	11	1.90	11	0.402	0.529
Fewer employment positions	1.87	11	1.79	12	1.81	12	0.044	0.834
Few schemes reach the contract stage	1.67	13	1.72	13	1.71	13	0.018	0.893

**Table IV.**  
Survey respondents' ranking of negative factors associated with PPP/PFI procurement

3.68) was seen by respondents as very important in determining how attractive a PPP/PFI scheme might be to the parties.

The high participation cost factor (Table IV: mean value 3.53) was also considered to be an unattractive feature of PPP/PFI schemes. These costs are not just incurred by the private sector, since the complexity and size of most schemes, together with the procedural requirements imposed by central government, mean that the public sector partner has to seek independent professional advice in the early stages.

*Important (mean score: 2.51-3.50).* The possibility that objectives are in conflict and cause confusion (Table IV: mean value 2.81) is recognised as real by PPP/PFI participants. The mean score for this factor, however, suggests that respondents do not think it constitutes an insurmountable barrier to overcome in deciding whether or not to engage in a PPP/PFI project.

Survey respondents confirmed that a lack of PPP/PFI experience and appropriate skills (Table IV: mean value 2.78) would be an important factor in assessing the attractiveness of a PPP/PFI scheme. The comparatively short history of this form of procurement in the UK probably contributes to this view, but it should be noted that Table I suggests that maturity in multiple role responsibility is beginning to occur in the private sector.

*Fairly important (mean score: 1.51-2.50).* The likelihood that a PPP/PFI project will be the subject of lengthy political debate (Table IV: mean value 2.48) is clearly understood by survey respondents. However, the mean score suggests that project participants do not regard this as an unmanageable process.

Given the contradictory view that the possibility of reducing project costs is an important factor in determining the attractiveness of PPP/PFI schemes (Table III: mean value 2.97), the weaker score attributed to a higher project cost (Table IV: mean value 2.43) suggests that respondents hold more optimistic views in this regard.

#### *Disparity of opinions between the public and private sector*

Some difference of opinion could be expected between the public sector and the private sector about the relative importance of factors that influence the attractiveness of PPP/PFI projects. However, of the 15 positive attractiveness factors, only three showed significantly different (at the 0.05 significance level) rankings by the public and private sector survey respondents: reduce public money tied up in capital investment; improve buildability; and save time in delivering the project. The mean rating values for private sector survey respondents for these three factors are all higher than those of public sector respondents. These factors are therefore considered more important PPP/PFI project attractions by the private sector than by the public sector. Since design and construction are bound together and are the responsibility of the private contractor, it is important for that party to actively seek ways of increasing productivity and saving construction time. Why the private sector should find the reduction in public investment a more attractive feature than the public sector is not clear.

For the negative factors associated with the attractiveness of PPP/PFI, ANOVA analysis of the survey results shows that none of the associated significance values is lower than 0.05. This suggests that there is no statistical difference of opinion on these factors between the public and the private sector.

### Factor analysis of attractiveness and negative factors for PPP/PFI project procurement

Factor analysis is used to extract a smaller number of factor groupings to meaningfully represent the relationships among a much larger set of variables (Norusis, 1992). The survey response data was subjected to this technique to determine whether or not groupings of the positive and negative factors in the perceptions of the attractiveness of PPP/PFI procurement could be established. If such groupings can be identified, they could provide valuable guidance to the public sector in pursuing development of PPP/PFI policy, and to the private sector in the preparation of the business case for particular projects. The findings of this analysis are presented here.

#### *Positive attractiveness variables*

A correlation matrix of the 15 positive attractiveness variables indicated that reduces public money tied up in capital investment has least correlation with other variables, since its partial correlations are all less than 0.30. This variable should be removed before factor extraction (Norusis, 1992). The anti-image correlation matrix confirmed this.

After eliminating the rogue variable, the correlation matrix was recalculated. The value of the test statistic for sphericity is large (Bartlett test of sphericity = 305.9318) and the associated significance level is small (Sig. = 0.0000), suggesting that the other fourteen variables are satisfied in terms of the principal component analysis. The KMO statistic is 0.7875, which according to Kaiser (quoted in Norusis (1992)) is satisfactory for factor analysis. The next steps are factor extraction and rotation, which can obtain smaller numbers of factors to represent the 14 variables.

Initial matrix and rotated matrix results are shown in Table V. The second, third and fourth columns comprise the initial matrix, and the three remaining columns (5, 6 and 7) are the rotated matrix, only presenting an Eigenvalue greater than 1.0. The total variance explained by each factor is listed in the second column of Table V. The third column

Component	Total	Initial eigenvalues		Rotation sums of squared loadings		
		Per cent of variance	Cumulative per cent	Total	Per cent of variance	Cumulative per cent
1	5.3511	38.2222	38.2222	3.4219	24.4419	24.4419
2	1.3687	9.7764	47.9985	2.5336	18.0973	42.5391
3	1.1383	8.1309	56.1294	1.4788	10.5626	53.1017
4	1.0518	7.5132	63.6426	1.4757	10.5408	63.6426
5	0.9625	6.8751	70.5177			
6	0.8228	5.8771	76.3948			
7	0.7876	5.6256	82.0204			
8	0.6984	4.9887	87.0091			
9	0.5229	3.7349	90.7440			
10	0.4284	3.0601	93.8042			
11	0.3121	2.2295	96.0337			
12	0.2448	1.7487	97.7824			
13	0.2087	1.4906	99.2730			
14	0.1018	0.7270	100.0000			

Note: Extraction method: principal component analysis

**Table V.**  
Initial and rotated factor matrix of PPP/PFI attractiveness variables

contains the percentage of the total variance attributable to each factor. The factors are arranged in descending order of variance explained. The fourth column shows that almost 63.64 per cent of the total variance is attributable to the first four factors. The other ten factors together account for only 36.36 per cent of the total variance. Thus, a model with four factor groupings may be adequate to represent the data.

Although the factor matrix obtained in the extraction phase indicates the relationship between the factors and the individual variables, it is often difficult to identify meaningful factors in this matrix. Most factors are correlated with many variables. Since one of the goals of factor analysis is to identify factors that are substantively meaningful, the rotation transforms the initial matrix into one that is easier to interpret (Diekhoff, 1992; Norusis, 1992). It is noted that rotation does not affect whether a factor solution fits well. The cumulative percentage of the four main components is equal after rotation, but the Eigenvalue and percentage of variance accounted for each factor does change.

The PPP/PFI positive attractiveness factor grouping based on varimax rotation is shown in Table VI. Each of the variables centres heavily around only one of the factors, and the loading on each factor exceeds 0.50. However, there are two variables: cap the final service costs and non-recourse or limited recourse public funding which do not receive a loading higher 0.50. This means that they do not correlate highly with any of the factors (Norusis, 1992).

The four PPP/PFI attractiveness factor groupings are interpreted as follows:

- (1) Factor Grouping 1 represents better project technology and economy.
- (2) Factor Grouping 2 is greater benefit to the public.
- (3) Factor Grouping 3 is public sector avoidance of regulatory and financial constraints.
- (4) Factor Grouping 4 is public sector saving in transaction costs.

*Better project technology and economy.* This principal factor grouping accounts for 24.4 per cent of the total attractive variances and represents five positive attractiveness variables indicating that PPP/PFI:

- (1) Improves maintainability.
- (2) Improves buildability.
- (3) Saves time in delivering the project.
- (4) Reduces the total project cost.
- (5) Transfers risk to the private partner.

Higher loadings are given to improves maintainability (sig. = 0.7598) and improves buildability (sig. = 0.7492). This indicates that technology innovations in a PPP/PFI to achieve better maintainability and buildability are the most positive attractive factors for adopting a PPP/PFI system.

Technology improvements are associated with economic benefits achieved through the project delivery process. These are reflected in the *time saved* in delivering a project (sig. = 0.7140), reducing the total project cost (sig. = 0.6612) and ensuring the transfer of risk to the private sector (sig. = 0.6404). In the primary analysis, risk transfer tops all the positive factor variables (Table V), which suggests that risk transfer is not a pure transfer.



Factor group	Factor Label	Component	Component value			
			Factor 1	Factor 2	Factor 3	Factor 4
Factor 1	Better project technology and economy	Improves maintainability	0.7598			
		Improves buildability	0.7492			
		Saves time in delivering the project	0.7140			
		Reduces the total project cost	0.6612			
		Transfers risk to the private partner	0.6404			
Factor 2	Greater public benefit	Caps the final service costs				
		Technology transfer to local enterprise		0.7485		
		Enhances government integrated solution capacity		0.7448		
		Accelerates project development		0.6082		
Factor 3	Public sector avoidance of regulatory and financial constraints	Benefit to local economic development		0.5598		
		Solves the problem of public sector budget restraint				
Factor 4	Public sector saving in transaction costs	Facilitates creative and innovative approaches		0.8633		
		Reduces public sector administration costs		0.6699	0.8213	
		Non recourse or limited recourse public funding				

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**Table VI.**  
PPP/PFI positive attractiveness factor grouping results after rotated factor matrix (loading)

**Notes:** Extraction method: principal component analysis; rotation method: varimax with Kaiser normalization; rotation converged in 21 iterations

The inference to be drawn from this factor grouping is that PPP/PFI projects are expected to be built better and last better; be built more quickly; and cost less - all at less risk to the client. The implication is that, unless projects can be seen to deliver these outcomes, the future use of PPP/PFI in the UK (i.e. beyond existing commitments) is unlikely to be sustainable and may be largely at the mercy of the prevailing political climate.

*Greater benefit to the public.* Factor Grouping 2 accounts for 18 per cent of the total PPP/PFI positive attractiveness factor variance, and represents four variables indicating that PPP/PFI:

- (1) Transfers technology to a local enterprise.
- (2) Enhances government integrated solution capacity.
- (3) Accelerates project development.
- (4) Benefits local economic development.

These components are all associated with the provision of benefit to the local society. Higher loadings are given to: transfers technology to a local enterprise (sig. = 0.7485) and enhances government integrated solution capacity (sig. = 0.7448). Technology transfer is regarded as one of most important factors for adopting PPP/PFI methods in developing countries, but is of less significance in developed countries such as the UK. However, it may be important in some industries, such as defence and IT (Trim, 2001) and, for some projects, local enterprises may be established to provide technical maintenance and technology development services.

Lower loadings are given to: accelerates project development (sig. = 0.6082) and benefits local economic development (sig. = 0.5598).

The inference from this factor grouping is that visible technology development and transfer is an important expectation of PPP/PFI. People want to see new technology at work (but not failing!) and benefiting local economies. While economies of scale are seen as important in providing value for money, people do not want to see this achieved through huge schemes whose development and completion time drags on simply because of their size.

*Public sector avoidance of regulatory and financial constraints.* Factor Grouping 3 accounts for 10.6 per cent of the total variance of positive attractiveness factor variance, and represents two variables indicating that PPP/PFI:

- (1) Solves the problem of public sector budget restraint.
- (2) Facilitates creative and innovative approaches.

A higher loading is given to: solves the problem of public sector budget restraint (sig. = 0.8633).

Another attractive aspect of PPP/PFI procurement is that it gives the public client and private contractor opportunities for creative and innovative approaches to develop the project; this has a loading of 0.6699. A PPP/PFI arrangement could facilitate creative and innovative approaches in the delivery of public services in two ways. First, a PPP/PFI procurement approach specifies desired outcomes rather than detailed definitions of inputs. This allows bidders to compete on the basis of their ability to develop unique and creative approaches to the delivery of the required project (Birnie, 1999; Government of Nova Scotia, 2000). Second, PPP/PFI procurement can join a non-profitable project and a profitable project as a single contract. For example, to attract private sector investment in sanitation, Sohail (2000) suggested that one favoured solution was to combine sanitation and water supply together as a package for contractors.

One implication of this factor grouping is that "creative accounting" in the public sector may emerge as the most innovative element of PPP/PFI procurement in practice. After all, there is little incentive for the private sector to innovate, given the associated risks that would be over and above those already transferred to this sector.

*Public sector saving in transaction costs.* There is only one positive attractiveness variable in Factor Grouping 4: reduces public sector administration costs, with 10.6 per cent of the total factor variance. It can be argued that the government could make savings in project transaction costs by reducing public sector administration costs in the processes of project tendering, preparation, and monitoring during implementation. However, there are contrary arguments which claim that the public sector thereby ends

up paying heavy fees to advisers and consultants in PPP/PFI (Public Services Privatization Research Unit, 2000; Centre for Public Services, 2001). The inference here is that benefits perceived in theory may not be deliverable in practice.

### *Negative attractiveness variables*

Factor analysis has also been applied to the 13 negative factors that influence the attractiveness of PPP/PFI.

The correlation matrix for the 13 community variables indicated all variables have a large correlation with at least one of the other variables in the set.

The value of the test statistics for sphericity is large (Barlett test of sphericity = 354.885) and the associated significance level is small ( $p = 0.000$ ), suggesting that the population correlation matrix is not an identity matrix. Observation of the correlation matrix of the negative factors shows that they all have significant correlation at the 5 per cent level, suggesting that there is no need to eliminate any of the variables for the principal component analysis. The KMO statistic is 0.835, which is satisfactory for factor analysis. These tests show that factor analysis is appropriate for the factor extraction.

Table VII presents the results after extraction and rotation. Only three negative factor groupings are obtained from the principal component analysis, with an Eigenvalue greater than 1 and explaining 64.44 per cent of the total variance. The factor grouping based on varimax rotation is also shown in Table VII. Each of the variables weighs heavily on only one of the factors, and the loading on each factor exceeds 0.50.

The three negative factor groupings can be interpreted as follows:

- (1) Factor Grouping 1 represents the lack of experience with PPP/PFI.
- (2) Factor Grouping 2 is the over-commercialisation of projects.
- (3) Factor Grouping 3 represents high participation cost and time.

Thus, a model with three factor groupings may be adequate to represent the negative factors for adopting PPP/PFI project procurement.

*Lack of experience with PPP/PFI.* This principal factor accounts for 22.1 per cent of the total variance negatively associated with the development of PPP/PFI projects. It consists of four components:

- (1) Lack of experience and appropriate skills.
- (2) Confusion over government objectives and evaluation criteria.
- (3) Excessive restriction on participation.
- (4) Higher charges to the direct users.

Higher loading is given to: lack of experience and appropriate skills (sig. = 0.8080). The importance of inexperience in a PPP/PFI approach is reflected in the fairly high loadings given to two other variables related to inexperience: confusion over government objectives and evaluation criteria and excessive restriction on participation (loadings of 0.7915 and 0.7874 respectively). The inference here is that the public client needs to make requirements and specifications more precise and easier to master in future PPP/PFI projects. As greater experience with PPP/PFI procurement is achieved, the changing climate of PPP/PFI should result in more competition by

Factor grouping	Factor Label	Component	Component value		
			Factor 1	Factor 2	Factor 3
Factor 1	Lack of experience	Lack of experience and appropriate skills	0.8080		
		Confusion over government objectives and evaluation criteria	0.7915		
		Excessive restriction on participation	0.7874		
		Higher charges to the direct users	0.5319		
Factor 2	Over-commercialisation of projects	Fewer employment positions		0.7301	
		Reduces project accountability		0.7289	
		High risk relying on private sector		0.6030	
		Higher project values		0.5911	
		Very few schemes have actually reached the contract stage		0.5700	
		Lengthy delays caused by political debate		0.5689	
Factor 3	High participation cost and time	High participation costs			0.9030
		Much management time in contract transaction			0.8523
		Lengthy delays in negotiation			0.8029
		Eigenvalue	2.879	2.825	2.674
	Cumulative percentage	22.15	43.88	64.44	

**Table VII.**  
PPP/PFI negative attractiveness factors after rotated factor matrix (loading)

**Notes:** Extraction method: principal component analysis; rotation method: varimax with Kaiser normalization; rotation converged in six iterations

attracting more entrants to the market. The remaining component in this principal factor is higher charges to the direct user, with a loading of 0.5319. This suggests that the public client must consider the project affordability more seriously.

*Over-commercialisation of projects.* This principal factor absorbs 21.7 per cent of the total loading variances, and includes six components:

- (1) A reduced public sector employment position.
- (2) A reduction in project accountability.
- (3) The high risk of relying on the private contractor.
- (4) Higher project costs.
- (5) Lengthy delays caused by political debate.
- (6) Few schemes reaching the contract implementation.

For the purpose of generating profit from the PPP/PFI arrangement, the project is developed under a commercialisation concept. This brings negative factors to the implementation of PPP/PFI by the private sector. Higher loading is given to a reduced public sector employment position (sig. = 0.7301). This indicates that employment is still a major concern in UK society. Only by creating more jobs and reducing the unemployment rate would the development of a PPP/PFI approach gain better public support.

The component reduction of project accountability has the next highest loading of 0.7289. This suggests that PPP/PFIs must avoid the situation where private profit motives are seen as paramount, and accountability and responsibility for the public end-users are neglected. The other four components under this principal factor grouping are related to excessive commercialisation of public projects, and have a moderate impact on the adoption of PPP/PFI procurement.

*High participation cost and time.* The third principal factor grouping is responsible for 20.6 per cent of the total variance of PPP/PFI negative factors. It consists of three components:

- (1) High participation costs.
- (2) A lot of management time spent in contract management.
- (3) Lengthy delays in negotiation.

All three components are considered as having a significant negative impact on PPP/PFI arrangements, with significant loadings of 0.930, 0.8523 and 0.8029, respectively.

The component high participation costs refers to high tendering costs and administration costs by the private contractors, and a high consultant fees spent by the public sector clients. The other two components reflect the fact that a PPP/PFI project is associated with both the public client and the private contractor contributing more time to monitoring project performance and extensive pre-contract negotiation.

## Conclusions

The relative importance of 15 PPP/PFI positive attractiveness factors was investigated through an opinion survey conducted within the UK. The results, in descending order of importance (for the top nine factors only), show that projects procured under PPP/PFI arrangements exhibit positive attractiveness because of their ability to:

- Transfer risk to the private sector.
- Solve the problem of public sector budget restraint.
- Non-recourse or limited recourse public funding.
- Reduce public money tied up in capital investment.
- Cap the final service costs.
- Improve maintainability.
- Facilitate creative and innovative approaches.
- Enhance government integrated solution capacity.
- Improve buildability.

However, PPP/PFIs are not a panacea for all public projects. Among the 13 potentially negative factors, which might cause potential participants to reconsider their involvement, the top three were:

- (1) A great deal of management time in contract transaction.
- (2) Lengthy delays in negotiation.
- (3) High participation costs.

Factor analysis of the same survey data showed the 15 positive and 13 negative attractiveness variables considered in the study can be grouped into four and three factor groupings respectively.

The four most important positive attractiveness factor groupings are associated with better project technology and economy, greater benefit to the public, public sector avoidance of regulatory and financial constraints, and public saving in transaction costs.

The three most important negative factor groupings are related to the inexperience of the public and private sectors, the over-commercialisation of projects, and high participation cost and time for participants.

These factor groupings, representing the positive and negative characteristics exhibited in PPP/PFI procurement, should be considered by public sector clients, and by potential private sector business case developers, in the process of selecting PPP/PFI options for construction projects.

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