

UNCERTAINTIES AND THE CHALLENGE OF LONG-TERM VALUE FOR MONEY IN THE DELIVERY OF PFI PROJECTS

Christian Henjewele, Ming Sun and Peter Fewings

*School of the Built and Natural Environment (BNE), University of the West of England (UWE),
Frenchay Campus, Coldhambour Lane, Bristol, BS16 1QY, UK*

PFI has successfully transformed the management of public sector construction projects by minimising construction risks and delivering projects with higher certainty in the price, cost, quality, and client satisfaction than is with the counterpart traditional approach. However, this has not entirely met the expectations of the procuring authorities or that of the government due to lack of consistency in achieving the desired and planned value for money. The analysis of case studies and official reports reveal that uncertainties in value for money (vfm) progress through all stages of the project life. The fluctuating vfm trend is mainly caused by turbulent market conditions, changing policies, and frequent shifts in the client requirements. Although clients have little control over external factors, a prudent management of the requirements and shorter appraisal and approval periods could potentially reduce the degree of uncertainties and improve long-term vfm.

Keywords: Private Finance Initiative (PFI), uncertainties, value for money (VFM).

INTRODUCTION

PFI advocates itself as government's best mechanism through which the public sector gets a high degree of certainty in long-term value for money (vfm) objectives in collaboration with the private sector through sharing of competencies and transfer of risks (HMT, 2006). For two consecutive decades, the UK government has acknowledged significant savings and efficiency improvement in the performance of the public sector not only in areas directly linked with PFI but also in other service sectors through sharing lessons gained from PFI. However, there are some areas where PFI needs improvement including the perceptions that the quality and robustness of risk transfer are the determinant of overall vfm. In response there is an over emphasis on risks management from the academic, policy and practitioner viewpoint followed by several tools and frameworks to evaluate and manage risks at every stage of the project life. Despite all the efforts, PFI has not entirely met the expectations of the procuring authorities or that of the government due to lack of consistency in achieving the desired and planned value for money. This suggests for the widening of risk perceptions to include uncertainty management that deals with both risk and opportunity management in predicting long-term influences in projects, whose importance is understated in the planning, procurement, and delivery of PFI projects. Using case studies and official reports, this research at its preliminary stages discusses the problem of uncertainties in the pursuit of value for money in PFI projects. It looks at how value for money indicators particularly costs and specified client-requirements pass through the intricate appraisal and planning processes to realise the desired vfm when the project starts operating. Ultimately, the research will

deploy empirical methods to establish trends for the vfm fluctuations and causes hitherto, which will help to develop a framework to improve the delivery of vfm amid the increased distrust from the public on the motive to continue using PFI as a preferred delivery mechanism.

CONCEPTUALIZING UNCERTAINTIES

Following a clearer distinction between risk and uncertainty put forth by Frank Night (1921), the concept of uncertainty has widely been discussed in respect to decision making, risk management, and in managing complexities and ambiguities. Risk scepticism that dominates the project management field is argued to suppress uncertainty management in the fears the latter deals with unknowns (famously abbreviated as 'unk-unks' - unknown unknowns) (Chapman and Ward, 2002). Night (1921) explains uncertainties in terms of dynamic and risk theories. The dynamic theory recognizes that project conditions are subject to unpredictable fluctuations and hence ignorance of the future and inaccuracy. Apart from the turbulence of the external environment, it is claimed that actions of the project participants, ambiguity of planning data and complexity of the processes may also lead to situations in which projects get out of control. Chapman and Ward (2002) assert that ambiguity in the interpretation and use of information coupled with the complexity of decision making process are the major sources of uncertainty. Flyvbjerg et al (2003) and Drummond (1999) claimed that, while a credible decision depends upon the quality of the interpretation and use of information provided, insufficient data and biased manner in which the planning data are approached may lead to decision errors and over optimism of project success.

Uncertainties have widely been grouped into four categories: variations, foreseen uncertainties, unforeseen uncertainties, and chaos (De Meyers *et al.*, 2002). Variations and foreseen uncertainties are usually identifiable thus can be managed using existing risk management frameworks. Unforeseen uncertainties and chaos are the popular 'unknowns' and are difficult to identify and arise from unanticipated interaction of many events. These uncertainties are typical in complex projects and those running over a long period. According to Jaafari (2001), uncertainties originate from three main sources; external factors, shifting business objectives and poorly defined methods for project realisation. The latter is due to poor knowledge and experience of the project team, as well as project complexity and absence of repetition.

PFI VALUE FOR MONEY VERSUS SUCCESS

Performance measurement is a common practice in the management of construction projects to ascertain how well cost, time, and quality objectives were achieved (Fewings, 2005). The performance in PFI construction projects is evaluated using the same metrics but often referred to as 'value for money' - a side-by-side comparison of the anticipated saving between PFI and traditional approaches. A successful PFI project is one that offers certainty in the price, delivery time, client satisfaction, and design quality. Eventually, delivering project to time, within cost and to the satisfaction of the client is not necessarily a success if it does not deliver optimum whole-life cost saving (HMT, 2006).

In practice, Vfm is defined using three models; the first model defines vfm on economy, effectiveness, and efficiency gains (Saxon, 2005). The three-vfm parameters are subjective and somehow immeasurable. The second model is that adopted by the OGC (2003) that looks at vfm as an optimum combination of the

whole life cost, quality, and user satisfaction. This model measures efficiency and quality in the provision of the public services at the best price not simply by “cost cutting” but broadly includes opportunities that would otherwise be missed (Roe and Craig, 2004). The third model is the ‘comparator’ scale (public sector comparator-PSC) commonly used in financial appraisal of PFI projects, which compares net present costs between competing solutions (Grimsey and Lewis, 2005). Saxon (2005) arguing on the subjectivity of the value metrics calls for a clearer contextual dimension in which it applies, be it user value, asset value, market value, social value, economic value, etc.

PFI PROCESSES, BIAS AND UNCERTAINTIES

PFI guidelines recognise uncertainties and the perception of them being ‘unknown and unquantifiable’ shapes the guidelines towards adoptive planning which embraces flexibility and an iterative process. However, more emphasis in the management of uncertainties focuses on the sensitivity analysis of potential risks and estimated value outcomes (Green Book- HMT, 2004). The Treasury, which oversees performance of the PFI policy in the UK, specifies criteria to aid the decision on the suitable delivery approach. However, it can be argued that, in real-life, the choice for PFI option is optimistically done beforehand. This is because, apart from cost, value and technology aspects of the criteria, the rest are known in advance as the procuring authority has a prior understanding of circumstances in which the project is required. The judgement ahead of processes potentially lead to long-term uncertainties as the rest of the procedures will be complied retrospectively (Zwikael and Globerson, 2006).

For inherent success of any construction project, performance rests on a three-level model (Shenhar *et al.*, 2002). The first level focuses on the product success (product model), the second level focuses on the business unit (strategic model), and the third level focuses at the project level (project model). Client value for money assessments in PFI adapt two of the levels leaving the product model to the discretion of the bidders. The Treasury guidelines require clients to assess vfm at programme level, project level and procurement level (HMT, 2006a). Though the approach aims to motivate bidders to bring in innovative ideas, in effect the client lacks control over the solution. Accordingly, Night and Fox (2004) point out a self-preserving circle between client, bidders, funders, and their advisers that provides little incentive for certainty. The circle starts with the client and the chosen advisers who develop plans in isolation of the potential investors. In their plans, the client wants assurance of optimum benefits from the deal by setting over optimistic requirements from interested bidders. In the tendering stage, tight client requirements and the interest of powerful funders expose bidders to a dilemma. To meet the interest of both sides, bidders employ best and expensive resources to develop attractive proposals. The proposed solutions are so specific and detailed that its evaluation takes a long time causing delays and extending use of consultancy. Funders who have powerful influence in the contract are less involved in the beginning and actively enter the project after the preferred bidders’ stage. Upon joining the project, funders tend to override previous negotiations and call for re-examination of the deal and the extent of risk transfer. As a result, the deal schedule, cost, and scope have to change which further extends time for consultants. At the close of the circle, expert advisers to both client and bidders loosely specify complex requirements which attract changes later which prolongs durations and cost.

Winter et al (2006) suggest that a combination of complexity and its intricate processes creates a great challenge in the management of the project. On this basis, it is tempting to presuppose that factors such as the nature and size of the projects, multiplicity of organisational units involved in the delivery chain, and technology used that give complexity to other type of projects (Williams, 1999; Liu, 1999; Ford, 2003), could also apply to PFI and so influencing the unpredictability of the planned outcomes. Inherently, complexity increases difficulty of process integration, planning and decision making, due to the difficulty of information flow, thus justifying the shift in procurement approach towards an integrated model like PFI that tends to bundle several functions in a single contract (Austin *et al.*, 2002; Shohet and Frydman (2003). However, such combination creates a new challenge for integrating teams, and multiple lines of functions on both client and supply side creating complex contractual relationships. To manage uncertainties in such a complex situation, PFI teams need to maintain a high level of competency throughout, which seems to be difficult due to frequent change of project personnel leading to discontinuity of knowledge about the project (PUK, 2006; Halter and Reeve, 2004).

METHODOLOGY

The research is a case-based investigation of the value for money trends in PFI projects. It will deploy empirical methods including documentary review and questionnaire survey to establish trends for the vfm fluctuations and causes hitherto. To explore vfm, particular targets do exist including service specifications, capital expenditure, delivery time, affordable unitary charges, and concession period, which are continually updated before signing a long-term service contract with the private consortium to validate vfm. The difference between the actual and planned outcomes at a particular stage provides a benchmark to establish the degree of uncertainty. The research re-uses data presented in official reports and four case studies from the NHS trusts. The analysis looks at potentials for uncertainties at key value formative and realisation stages namely; planning and appraisal, procurement, and operating. The construction phase is omitted from this analysis in recognition that the private consortium bears main responsibility for the performance and risks and such data may not be accessed from the client.

In the planning and appraisal stage the client team and expert advisors identify needs, set objectives and deliverables, appraise different solution to meet the needs, and decide the procurement route to accomplish the objectives. The process repeats in two stages. The first is the strategic business case (SBC) stage that interprets strategic business requirements into service specifications. The second stage is the outline business case (OBC), which appraises the appropriate delivery route. In a typical project, the OBC includes a public sector comparator (PSC) which compares PFI with the traditional public capital solution.

Procurement of the PFI project starts with the invitation to expression of interest from bidders advertised in the OJEC journal and ends with awarding the contract. The stage builds on the OBC and upon successful negotiation with the preferred bidder develops to a full business case (FBC) which integrates the bidder's solution and reappraises the affordability is prepared before the signing of the contract. This is the period of significant 'unknowns' and the client loses control over the outcomes as he is not sure of who is interested in the scheme, which solutions will be proposed, which risks will be transferred and at what cost.

The operating stage is the longest of all stages in the project life. The relationship between the public sector client and private sector operator is reinforced by a contract for the provision and maintenance of the services in exchange with a monthly unitary payment upon satisfactory performance (NAO, 2006). Typical PFI contracts last for over 20 years thus, subjecting the projects to multiple unknowns and unanticipated events.

RESULTS

Uncertainties in the development phase

Table 1 summarises capital cost escalations and the influence of different factors in four PFI hospital projects. Although information about the strategic business case stage was not available for every project, the data for the two projects shows that there are significant changes between SBC and OBC. The result shows that all the four projects experienced escalation between OBC and FBC ranging from 19 to 110 per cent. External factors mainly inflation, increase in construction costs, and changing policies were variably felt in every project. Rethinking client needs as the project progresses is the second common reason that contributes between 9 and 82 per cent of the gross escalations before adjusting for affordability. The changes mainly involved the project scope, designs and specifications, and new requirements. Contingencies and consultancy fees which depends on the other factors increased in three of the four projects though the overall contribution was below 11 per cent. In response to cost escalations, three of the projects reduced some services to bring costs to affordable figures.

Table 1: A breakdown of capital cost escalation from SBC to FBC and causes for escalations

	Changes between SBC and OBC (%)	Changes between OBC and FBC (%)	Effect of the external factors (%)	Effect of Changed client needs (%)	Effect of team factors (%)	Effect of the adjustments for affordability (%)
Project 1 (£967m)		109.31	129.65	28.57	4.98	-53.90
Project 2 (£72m)	9	19.32	2.59	20.15	4.34	.00
Project 3 (£270m)		108.96	32.04	81.85	.00	-5.06
Project 4 (£193m)	412	50.78	38.28	9.38	10.94	-7.81

Source: Based on the projects' Full business cases (available from the respective websites)

Table 2 provides detailed information of these case studies revealing that projects or processes that take a long time to accomplish are more likely to suffer from cost escalations. For instance, project 2 which completed OBC and bidding within a short time suffered less from cost escalations than other projects which took longer to finish.

Table 2: Detailed information of the case studies

Project	Capital cost (£m)	Period of OBC development	Tendering period		Project status	Year opened to operation	Project scope and features
			OJEU	financial close			
Project 1	967	1997 - Feb 2000	Feb 2002	Mar 2006	Operating	Jul 2006	Development of new teaching hospital and redevelopment of the existing. The original OBC was withdrawn and the FBC was reviewed 12 times
Project 2	72	1999 - Dec 2001	Mar 2002	Nov 2003	Operating	Feb 2007	Development of Emergency Care and Diagnostic Centre. Operations were planned for Sep 2005 but delayed for 16 months
Project 3	270	1998 – Jun 2001	Jul 2001	April 2005	Construction	Apr 2008 - 2013	Service rationalisation including new build and rehabilitation. The project is delivered in phases
Project 4	193	1999 - Dec 2002	Aug 2001	Dec 2005	Construction	2007 - 2010	Reconfiguration of acute services & site rationalisation. The project is delivered in phases

Source: full business cases from the respective projects

Uncertainties in the operating phase

Table 3 presents a breakdown of escalations in the capital cost and annual payment experienced in projects surveyed by the National Audit Office in 2006 (NAO, 2008). The report appended 70 major changes made in 40 operating PFI projects across all sectors. The analysis compares the increase in both capital costs and associated payment in the first year with the contract capital cost and annual unitary charges for that particular year respectively. Results reveal that both mature and early operating projects made changes, which caused a significant increase in costs. While early operating projects (at most three year in operation) suffered more from increased capital costs, older projects felt the impact in the annual payments.

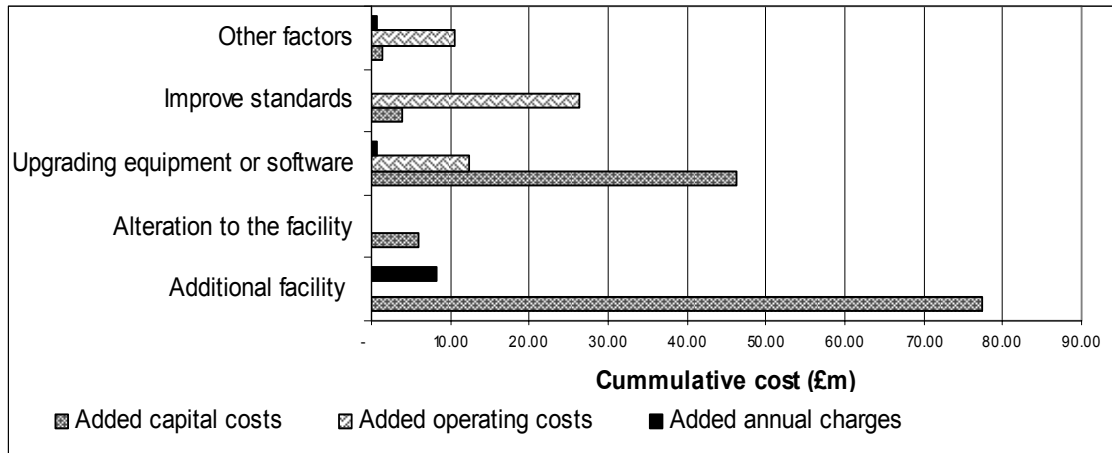
Table3: Breakdown of escalation in the capital cost and annual charges caused by changes made in the operating stage

	Escalations in capital costs					Escalation in the annual payments [2006]				
	No change	0 - 5%	5 - 10%	10 - 15%	Above 15%	No change	0 - 5%	5 - 10%	10 - 15%	above 15%
Early operating	2	22	2	1	1	15	11	0	0	0
Mature operating	14	18	0	0	3	12	18	1	0	0

Source: Based on NAO (2008) and the database of the PFI projects (HMT, 2007)

The report goes further identifying changes that led to the cost escalations for each project as summarised in figure 1. The analysis reveals that, additional facilities that include new buildings or extensions and the upgrading of equipment and software increased the capital costs and associated annual charges, while the need for improved

service standards by requesting for additional services or improved specification increased the whole-life operating cost. Other factors such as market testing, termination of a service contract, and consultancy fees to undertake changes had a noticeable effect.



Source: Based on the survey by NAO (2008)

Figure 1: The breakdown of reasons leading to changes and subsequent escalation of the capital cost, operating costs and unitary charges.

DISCUSSION

The analysis has shown that uncertainties progress throughout the life of a PFI project from its initiation through to operating phases. It is clear that, the procuring authority takes the overall charge of the processes in the early stages to define, appraise and plan how to deliver the best value. The value conceptualisation and generation process all depend upon client’s definition of long-term requirements to meet strategic goals upon which costs and delivery schedules are also based. These in spite of taking long time in appraisal, repeatedly have to be approved by the higher authorities before approaching the market or signing a contract. While such a robust scrutiny is expected to deliver high quality plans, it often leads to reappraising the project. Information released by the Department of Health under the Freedom of Information Act reveals that in October 2007 at least 14 projects halted the procurement process for reappraising. Similarly, in the Department for Transport, three major projects were abandoned in the bidding process due to time-related cost escalations. Time to get the business case approved and the subsequent recommendations are among the ‘unknowns’.

Another area of potential uncertainty is the method used to identify and evaluate the long-term requirements and converting them into output specifications. Business cases used in this analysis all had clearly stated that stakeholders were involved almost at every stage and in some cases there was a public consultation. The noted continuous change or new requirements within a short period raises concern for the robustness of the appraisal method in use, biases in the interpretation and use of available information, and experience of the players involved to manage such complex and high-stake projects (Flyvbjerg, 2002; Ward and Chapman, 2002; Jaafari, 2001; Drummond, 1999).

Changes in the pre-implementation stages may be desirable and acceptable because their impacts can be minimised by reversing the process or even reverting to other delivery options that might provide better vfm than PFI but such changes in the

operating stage are less likely to provide value for money. The NAO (2008) report makes it clear that long-term contracts do not allow further competition to occur during the operating stage, hence limiting the opportunity to improve vfm apart from the absence of a comparator to benchmark with. This analysis has shown that most escalations were prompted by the client-driven changes, risks of which were not shared with the consortium. It may be less justifiable to group the client-driven perspectives as unforeseen or chaotic as they were knowable by the teams. Though it was difficult to ascertain the likelihood of it happening, client teams had a potential to reduce the impact. Projects that have just started operating, which have a major shift in the requirements for built facilities, highlight the need to have a strong strategy for managing long-term requirements.

The findings though they partly contradict the common conception that PFI provides a high degree of certainty, they do support a reason for partnership between public and private sectors. It is apparent, in early stages where public sector client acted in isolation of the potential investors, projects took longer to surface, the outcomes were uncertain and the work done was insufficient that it needed several reviews - still affected the operating stage. In contrast, the project implementation stage successfully transferred perceived construction risks to the private sector and there was a high level of certainty.

CONCLUSION

Official reports as well as independent studies provide a strong case to support that PFI has successfully transformed the management of public sector construction projects by assuring a high level of client satisfaction and minimising construction risks, particularly time and cost overruns, while establishing a record for delivering ultramodern and excellent services. This analysis, though limited by small sample and secondary data; reveals that PFI projects still face the challenge to improve certainty in the early stages of the project to have an assurance of long-term value for money. Such assurance could be achieved by keeping short the development stage to minimise the exposure to unanticipated events, and by a prudent management of the long-term service requirements. The analysis suggests that cost escalations are influenced by time spent to develop business cases and obtain the required approvals which subjects the project plans to adverse events such as inflation, increase in construction costs, and changing policies. Both the NAO (2004) and PAC (2005) recommend that speeded up planning and approval processes have potential to stabilise the forecast outcomes and minimise the risk of cost rising. The flexible planning and contracting approach used in PFI though is an effective way of incorporating 'unknowns' as they emerge, it can be argued here that it provides less incentive for procuring authorities to prudently manage their requirements. The involvement of private sector investors attests to bring about a robust solution to tackle the public sector 'weak points'. An argument for earlier involvement will need further research to ascertain the causes before there are any proposal for how early the private sector can be involved and what functions to assume. This takes into consideration that clients know their strategic requirements better than the investor does and that such functions are currently being carried in close association with expert advisors, PFI units, and some professional bodies with diverse skills and experience.

REFERENCES

Austin, S, Newton, A, Steele, J and Waskett, P (2002) Modelling and managing project complexity. *International Journal of Project Management*, **20**(3), 191-198.

- De Meyer, A, Loch, C H, and Pich, MT (2002) Managing project uncertainty: from variation to chaos. *MIT Sloan Management*, **43**(2), 60-67
- Drummond, H, (1999) Are We any Closer to the End? Escalation and the Case of Taurus. *International Journal of Project Management*, **17** (1), 11-16
- Fewings, P (2005) *Construction Project Management: an Integrated Approach*. London: Taylor and Francis
- Flyvbjerg, B, Bruselius, N, and Rothingatter, W (2003) *Megaprojects and Risk: An Anatomy of Ambition*, Cambridge: Cambridge University Press
- Ford, D N (2002) Achieving multiple project objectives through contingency management. *Journal of Construction Engineering and Management* **128**(30), 30-39
- Grimsey, D and Lewis, M K (2005) Are Public Private Partnerships value for money?: Evaluating alternative approaches and comparing academic and practitioner views. *Accounting Forum*, **29**(4), 345-378
- Halter, W and Reeve, S (2004) *Beyond Contract- What makes a PPP successful?*. London: New Local Government Network (NLGN)
- Hellowell, M and Pollock, A M (2007) Private finance, public deficits: A report on the cost of PFI and its impact on health services in England. *University of Edinburgh: Centre for International Public Health Policy*, University of Edinburgh
- HM Treasury (HMT) (2003) *PFI: meeting the investment challenge*,
- HM Treasury (HMT) (2004) *The Green Book: Appraisal and Evaluation in Central Government Treasury Guidance*. London: The Stationery Office
- HM Treasury (HMT) (2006) *PFI: strengthening long-term partnerships*
- HM Treasury (HMT) (2006a) *Value for Money assessment Guidance*, November 2006
- House of Commons Committee of Public Accounts (PAC) (2005) *Improving public transport in England through light rail*, Eleventh Report of Session 2004–05, Published on 5 April 2005, London: The Stationery Office Limited
- Jaafari, A (2001) Management of risks, uncertainties and opportunities on projects: time for a fundamental shift. *International Journal of Project Management*, **19**(2), 89-101
- Liu, A M M (1999) A research model of project complexity and goal commitment effects on project outcome. *Engineering, Construction and Architectural Mngt*, **6**(2), 105-11
- National Audit Office (NAO) (2007) *Benchmarking and market testing the ongoing services component of PFI projects*, Report by the Comptroller and Auditor General | HC 149 Session 2006-2007 | 8 March 2007
- National Audit Office (NAO) (2007b) *Improving the PFI tendering process*, Report by the Comptroller and Auditor General | HC 149 Session 2006-2007 | 8 March 2007
- National Audit Office (NAO) (2008) *Making Changes in Operational PFI Projects*, Report by the Comptroller and Auditor General, HC 205 Session 2007-2008, 17 January 2008
- National Audit Office (NAO) (2006) *A Framework for Evaluating the Implementation of Private Finance Initiative Projects: 1 and 2*, 15 May 2006
- National Audit Office (NAO) (2004) *Improving public transport in England through light rail*, Report by the Comptroller and Auditor General | HC 518 Session 2003-2004: 23 April 2004
- Night, A, and Fox, I (2004) Why is so expensive to Bid for PFI contract?. In: Ghobadian, A, Gallear, N, O'Regan, N, and Viney, H., (eds.) (2004) *Public- private Partnerships: Policy and Experience*, Palgrave Macmillan

- Night, F H (1921) *Risk, Uncertainty, and Profit*. Boston: MA: Hart, Schaffner & Marx
- Office of Government Commerce (OGC), (2003) *Project procurement lifecycle the integrated processes*. Achieving Excellence in Construction Procurement Guidance (3)
- Partnership UK (PUK) (2006) *Report on Operational PFI Projects*, March 2006
- Roe, P and Craig, A (2004) *Reforming the Private Finance Initiative*. London: Centre for Policy Studies
- Saxon, R (2005) Be Valuable. *Building and Estates Forum: Constructing Excellence*
- Shenhar, AJ, Tishler, A, Dvir, D, Lipovetsky, S and Lechler, T (2002) Refining the search for project success factors: a multivariate, typological approach. *R&D Management*, **32**(3), 111-126
- Shohet, I M and Frydman, S (2003) Communication patterns in construction at construction manager level. *Journal of Construction Engineering and Management*, **129**(5), 570-577
- Chapman, C and Ward, S (2002) *Managing Project Risk and Uncertainty: A Constructively Simple Approach to Decision Making*, Sussex: John Wiley & Sons
- Williams, T M, (1999) The need for new paradigms for complex projects. *International Journal of Project Management*, **17**(5), 269-273.
- Winter, M, Smith, C and Morris, P, (2006) *Directions for future research in project management: The main findings of a UK government-funded research network*
- Zwikael, O and Globerson, A (2006) From Critical Success Factors to Critical Success Processes. *International Journal of Production Research*, **44**(17), 3433-3449