

Understanding project failure using agency theory: the case of a high-speed rail mega-project in Saudi Arabia

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Abstract

Many technical factors have been suggested as reasons for major infrastructure project failure, such as complexity, scale and a lack of precedent. We found that there appeared to be a gap concerning Agency Theory (AT) and its connection with large, temporary multi-organizational projects. Given that large, complex projects of the nature we were examining are, in large part, contractually mediated, we found this omission particularly surprising. In our research, we found a number of agency problems (APs) which we established to be either causes in their own right or the root cause of other causes of project failure. Our research has also revealed that AT warrants further exploration as a theoretical means of understanding project failure.

Keywords: Mega-projects; Project failure; Agency theory.

Introduction

There is a belief often expressed within the literature that the current techniques used within project management have matured over recent decades (Cooke-Davies et al., 2003; Patanakul et al., 2010). However, the rate of project failure has never been greater and it has been claimed that performance in mega-project management has not improved over the last 70 years (Flyvbjerg, 2017). For example, Robertson et al. (2006) have reported that more projects overrun in time than are completed within the original allocated time scales. These overruns commonly occur in a rate of 40% to 200%. There are numerous examples of mega-projects that have failed along one or more of the classic parameters of performance (timescale, budget and specification).

Flyvbjerg, (2014) described mega-projects as a magnified version of other types of smaller projects. However, they are a different breed of project, as they are associated with higher levels of aspiration, greater complexity and larger numbers of stakeholders involved. Many technical factors have been suggested as reasons for major

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infrastructure project failure, such as complexity, scale and a lack of precedent. However, among others, Hodgson and Cicmil (2006) and Söderlund (2013) also stress the importance of looking at the human elements of a project. With this in mind, we sought to examine projects of this nature from a more theoretical basis. We found that there appeared to be a gap concerning Agency Theory (AT) and its connection with large, temporary multi-organizational projects. Given that large, complex projects of the nature we were examining are, in large part, contractually mediated, we found this omission particularly surprising.

In light of this, we devised the following research question:

To what extent can agency theory be utilised in the analysis and explanation of mega-project failure in the case of a High-Speed Railway project in Saudi Arabia?

This led us to establish the following research objectives:

- To identify the specific agency problems (APs), if any, which occurred within the case study project.
- To establish the extent to which these APs explained the project failure observed in the case study project.

Review of the literature

Projects can typically be seen as time-limited, unique (or at least, containing novel characteristics) endeavours involving the consumption of resources to deliver a specific set of objectives. Project management can be seen from two perspectives. On the one hand, an orthodox view essentially outlines the management of the elements of a project. As an example, Söderlund (2013) meanwhile looked at defining the term project as:

“A particular kind of task, a temporary endeavour, and project management is the solution to solving that task. The project could then be broken into a series of activities, work packages, subprojects, and milestones. Project management as such is very much oriented towards these activities, including conceptual design, feasibility study, detailed design, detailed planning, etc.” (Söderlund, 2013, p. 124).

On the other hand, however, the reality of a project delivery highlights that a project is not a simple operation that is often repeated. Instead, it involves organisational and social practices that characterise every project to be a unique endeavour (Söderlund (2013), which has led researchers to conceptualise projects differently. For example, Linehan and Kavanagh (2006) defined projects as:

“...an emergent outcome of disparate, ambiguous, political practices.” (Linehan and Kavanagh, 2006, p. 55).

Picking up on both these points, Larson and Gray (2014) described projects as having two dimensions within the execution process. These are the technical and the

sociocultural dimensions. The first dimension is concerned with the technical side of the project management process. This involves all the formal and structural content related to this discipline, which includes project planning, scheduling and project control.

By contrast, the second dimension is the sociocultural part of project management. According to Larson and Gray (2014), this dimension:

“Involves the much messier, often contradictory and paradoxical world of implementation. It centres on creating a temporary social system within a larger organizational environment that combines the talents of a divergent set of professionals working to complete the project.” (Larson and Gray, 2014, p. 17).

Therefore, project managers have to apply their leadership to form a project culture that enables the project actors to use their self-motivation to work as an effective team that can identify and resolve problems, deal with project changes and redirect the project back on track. This dimension also includes facilitating the interface between the external environment and the project. Project managers must consider the customer expectations, negotiate the requirement of the top management and manage and monitor other stakeholders, such as subcontractors.

What this emphasises is that many projects involve the relationships between actors representing the interests of many parties, all of whom are involved in the delivery of the project. For many projects, the way the relationships between these actors is mediated is through the use of contracts. What this highlights is the relative roles of the parties in the contract play in delivery of the project activities and, ultimately, its objectives. The focus and behaviour of the various project actors may differ as a result of the limited project duration, their project goals and objectives, the cultural and social diversity within the project team, and the transition to and from different project phases. Since Meyerson et al. (1996) and Lundin and Söderholm (1995) suggested that projects with a certain level of complexity were expected to be delivered by a temporary organisation (TO) on the behalf of a permanent organisation (PO), it follows that the organisational structure of a project is formed of the principal and numerous agents. This formation indicates the need to understand agency theory (AT), as a strand of the project management literature.

Given the apparent importance of agency theory as a way of understanding the multiple agents and their relationships with the principal in projects, we were surprised to discover very little prior research exploring the relationship between agency problems and project failure. They were limited to Wilhelm et al. (2016) in supply chain management; Clipsham et al. (2011) and Teo et al. (2010) in IT; Bardsley (2001) in educational research projects; and Ceric (2012 and 2014) in construction projects. This highlighted to us the need to explore this theoretical aspect more closely.

Agency theory is concerned with the principal's and the agent's opportunistic behaviours and how to manage them (Mitnick, 2013; Steinle et al., 2014). There are five main components associated with AT that seemed relevant to our enquiry:

1. The presence of a principal-agent division as a result of the separation between corporate ownership and control.

2. On many occasions there is an asymmetry of information between the principal and the agent(s). Information asymmetry occurs through the communication of insufficient and incomplete information between principals and agents (Ceric, 2012).
3. The third component, opportunism, brings the principal-agent division and information asymmetry to life. It occurs as a result of the willingness of the agent to exploit the situation and make decisions to suit their agenda. Ahola et al., (2014) has previously discussed the area of opportunism as a factor of project failure.
4. Mechanisms in the literature proposed to overcome the agency problem are referred to as managing opportunism. The focus here has been on contract and incentives design.
5. The final component is the multiple principal-agent problem, relevant to us as project environments usually involve more than one principal-agent relationship.

Opportunism occurs when principals accept to be in a vulnerable position at a time when no trust exists in the relationship with the agent. In addition, principals do not have sufficient access to the information held by the agent. Due to this lack of information, principals do not know why the agent or project manager is making the selections and decisions they make and do not trust whether these decisions will be delivering the principal's interest (Jensen, 2000). This information asymmetry can lead to lack of trust within the principal-agent relationship, which leads to inflexibility by the principal and establishes the desire to control their projects themselves (Turner, 2004). The reason behind this is explained through the principal-agent theory. This theory suggests that principals act this way out of fear of the agent's intention to capitalise their own utility rather than the principal's. One way to control this fear is by introducing a strict communication structure (Jensen, 2000). So, if the aim of both parties is to increase their utilities and economic growth, then it is plausible to believe that the agent will not prioritise the principal's best interest; this is where the agent's opportunism will become active.

The principal-agent division and information asymmetry can result from the agent's exploitation of the principal's vulnerable position. This can take place in two different stages of a project. Opportunism in each stage has been distinguished as a totally different type. There are two types of opportunism that have been identified by many researchers, such as Eriksson (2016); Ceric (2012) and Caers et al. (2006); these were defined as adverse selection (pre-contractual) and moral hazard (post-contractual) opportunism.

Adverse selection is the type of opportunism that occurs before signing a contract between principal and agent. At the pre-contractual stage, the principal can only gather public information about the agent. In the same instance, it is challenging for the principal to obtain private information about the agent. Therefore, due to this information asymmetry, the principal is not able to observe, collect or verify the relevant information and characteristics about the agent before setting up the contractual

documentation (Caers et al., 2006; Saam, 2007). The failure to solve the information asymmetry between principal and agent in such a case will affect the selection process of the agent by the principal. This may result in choosing an agent with the wrong level of competence and who may not be capable to deliver the principal's goals.

The second type of opportunism is moral hazard, which is known as the post-contractual opportunism (Eriksson, 2016). It occurs following the relationship division between principal and agent, as well as a degree of information asymmetry, when the principal is not fully confident that the agent will act on the principal's behalf once the contract is signed. This is where the agent can obtain more collected information through actions, which might be very difficult for the principal to observe (Fenling and Feiran, 2012). Furthermore, Alparslan (2006) argued that not only hidden actions can cause moral hazard, but hidden intentions as well, and this exacerbates the difficulty of the principal to identify this type of agent opportunism.

Because of the low level of confidence the principal has towards the agent, and the information advantage the agent has over the principal, the agent is able to prioritise his own interests from the endeavour. This prioritisation will be at the cost of the principal's interest. Therefore, the agent will only deliver the principal's interests if they are aligned with his (Müller et al., 2005). AT suggests a solution for this problem through the realignment of principal and agent interests in the contract documentation. The contract between the two parties ought to include action that is most appropriate to the principal's demands from the project (Müller et al., 2005).

Agency problems (APs) appear in cases where one party delegates or authorises another to conduct and manage certain tasks or activities. In a project context, the first party is the project owner (principal) and the second is the project contractor (agent) (Wu et al., 2014). Certain projects and industries involve more than one party who act as the principal and the agent (a case where a subcontractor is hired). Some previous research (e.g. Toor and Ogunlana, 2010) has noted that certain types of industries (such as construction) are 'highly goal conflicted'. The reason is the involvement of numerous stakeholders in the project, with the possibility that each stakeholder may have different goals which is known as the multiple principle-agent problem. It becomes apparent that the magnitude of multiple APs can affect the project severely, with each different stakeholder having a certain agenda to fulfil by completion of the project. Therefore, it is essential to realise the importance of the investigation within this area of research, to further understand the issue of the multiple APs.

Design and methodology of the study

In order to investigate the contribution of agency problems to mega-project failure, we explored a case study project. For this study, we had access to a new high-speed rail project in Saudi Arabia, valued at about 51 billion Saudi Riyals (approx. €11.5 billion). This case study enabled us to carry out an extensive investigation into the research problem from multiple perspectives. The research involved two rounds of interviews carried out at different stages in the project supplemented by on-site non-participant observation of project meetings and operational activities. In addition, we were given

access to substantial project documentation such as planning documents and software and contractual documents.

These multiple data sources enabled us to develop a rich picture of the relationships between the different parties on the project. The interviews allowed us to understand the situated perspectives of specific project actors, allowing us to access their opinions and views about their own conduct and that of the other project actors from their own, unique perspectives. The observation data helped to validate the interviews and allowed us to better understand the inter-personal dynamics of the project participants from an external perspective. Meanwhile, project analysis provided us with an understanding of the structural basis of the relationships in the project.

In total, we carried out 21 interviews at three different areas of the project. The interviews were conducted twice, once at an early juncture in the project and again towards completion of the project, when the full extent of project failure was becoming apparent. Interviews were conducted with client representatives (the principal) as well contractor representatives from a number of different contractors and engineering consultant representatives (the agents). In terms of failure, completion of each of the three areas was more than three years late. Area One was in excess of 6 billion Saudi Riyals (€1.34 billion) over budget and the project as a whole created substantial external problems and disruption to Saudi locals.

Findings and discussion

Due to the context of Phase 1 of this mega-project case which involved one client, one consultant and three different contractors, seven relationships were identified for the scope of this research. These relationships are illustrated in Figure 1.

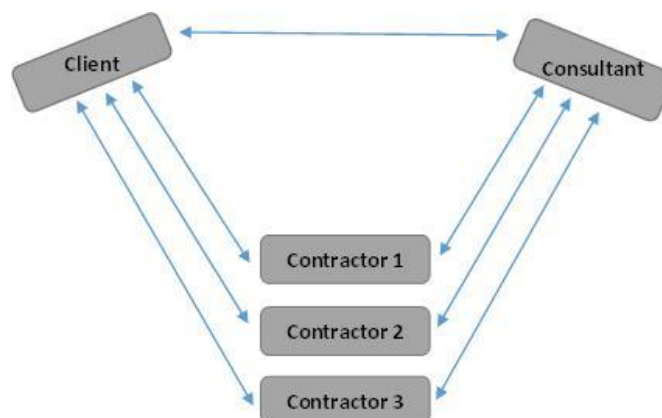


Figure 1. Relationship diagram for the high-speed rail mega-project

In the interviews, we looked for evidence of agency problems based on our review of the theory. Each relationship was reviewed individually using our data. Within each relationship considered, one or multiple APs were identified. In cases where a relationship had multiple APs, we focused first on pre-contractual APs (adverse selection), followed by the post-contractual APs (moral hazard). Figure 2 shows the analytical process for identifying each AP.



Figure 2. Analytical model for identifying agency problems

In total, we identified eight agency issues that we regarded as being important in creating problems in the delivery of the project. Using the reports from the interviewees and our own qualitative judgement, we rated the relative severity of each AP on a 1-4 scale (*= low severity; ****= high severity). The results of our analysis are shown in Table 1.

Table 1. Agency problems impact, intervention and outcome

Relationship (R)	Agency problem (AP)	Issue	Impact (****)	Intervention	Impact Post-Intervention (****)
R1	AP 1 'Adverse selection' (with additional Moral Hazard)	Consultant misrepresented the qualification of his employees to win the tendering process.	**** 'time & cost'	Adverse selection was harder to observe by the client in order to react.	**** 'time & cost'
R1	AP 2 'Moral Hazard'	Late and wrong supervision approvals by the project consultant.	**** 'time & cost'	The client's intervention was by monitoring the performance of the consultant.	** 'time & cost'
R2	AP 3 'Adverse selection'	Contractor 1 underestimated and misrepresented the project cost.	**** 'time & cost'	Client had no chance to intervene as the tendering process was in accordance with the national law.	**** 'time & cost'
R2	AP 4 'Moral Hazard'	Contractor 1 took over the project management after dismissal of qualified staff.	**** 'time & cost'	It was challenging for the client or the consultant to intervene due to lack of awareness of the issue at the time. Furthermore, the contractor's incentive was money, but financial incentives did not exist. Although, penalties were imposed for any delay.	**** 'time & cost'
R2	AP 5 'Moral hazard'	Contractor 1 employed illegal workforce to work for the project.	**** 'time & cost'	The client imposed penalty clauses for the delay and required the contractor to increase the project manpower but no result.	**** 'time & cost'

R2	AP 6 'Moral hazard'	Contractor 1 misrepresented the designer capability to design this project.	*** 'time & cost'	The client applied penalty clauses on the contractor if any delay occurred. Occasionally, the client issued technical approvals on modified designs.	** 'time & cost'
R4	AP 7 'Adverse selection'	Contractor 3 employed illegal workforce.	*** 'time'	The client obtained exemption for illegal workforce for this project; the contractor reacted accordingly.	-
R5	AP 8 'Moral hazard'	Contractor 1 failed to submit project plans to the consultant.	**** 'time & cost'	The consultant prepared a detailed project planning document and it was handed in to the contractor.	** 'time & cost'

From the table, it can be observed that there were three scenarios in relation to principal (client) intervention. The first scenario was that the principal did not intervene. This was mainly in relation to adverse selection by the project consultant (R1) and Contractor 1 (R2). This was because adverse selection was harder to detect retrospectively, according to the Saudi tendering and procurement law. The second scenario was that the principal did intervene in an attempt to reduce the AP impact, but this resulted in no change to the outcome. This scenario can be seen in APs four and five, where the problems were within the contractor's internal organisational management. The final scenario was where the intervention did result in a reduction of the impact of the AP on the project failure. The degree of these outcomes, however, were varied. For example, in AP seven, the AP was completely eradicated as the two actors co-operated. However, in APs two, six and eight there was only a marginal change in the impact on project failure.

To provide a better picture of the dynamic and time-based nature of the APs, we have tracked them against various stages in the project timeline (Figure 3).

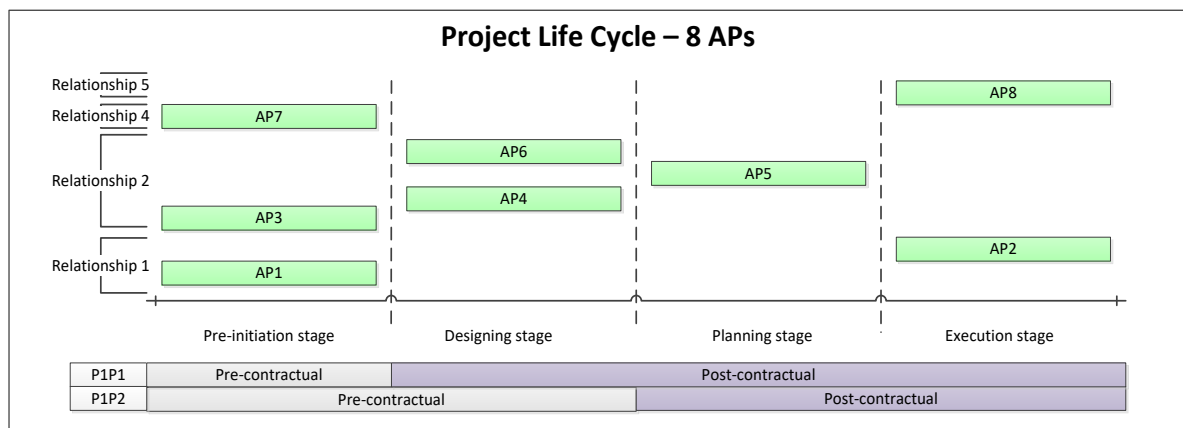


Figure 3. Project lifecycle – 8 agency problems

There were three adverse selection (pre-contractual) opportunistic behaviours which occurred in the project pre-initiation stage. The other five APs were moral hazard (post-

contractual) opportunistic behaviours – two occurred at the designing stage, one at the project planning stage and two at the execution stage. These eight APs, from four different relationships, were found to have a prominent role in the project failure, as described by a number of interviewees and corroborated by our other evidence.

However, the severity of the impact of the different APs did vary. Some APs had a high level of importance and caused a considerable project delay and failure; for example, on interviewee (in AP two) noted that “the consultant’s performance caused roughly 40% of the project delay”.

Other APs had a lower level of importance in the project failure, either because of the nature of the AP or because the principal (client) did manage, once the opportunism became apparent, to successfully intervene in an attempt to reduce the AP’s impact, although the outcome of the intervention was varied in different APs in terms of the degree of its success.

Conclusions

Given the predominance of multiple agents, information opaqueness and principals with limited knowledge in mega-projects, we were surprised at the lack of previous research in agency theory in this area. In particular, there seems to be very little research in the multiple principal-agent problem. With this in mind, we investigated this problem in a mega-project and discovered significant project failure associated with agency problems around adverse selection and moral hazard. Anecdotally, conversations with practitioners suggest that these agency problems are a well-recognised and commonplace. This implies that there is great scope for further, rigorous research in this area to understand better the nature of agency problems in projects.

References

- Ahola, T., Ruuska, I., Artto, K. & Kujala, J. (2014) What is Project Governance and What are its Origins? *International Journal of Project Management*. 32 (2014), 1321 – 1332.
- Alparslan, A. (2006). *Structuralistic Principal Agent Theory: A Reformulation of Hidden Action Models From a Structuralistic Perspective*. Wiesbaden: Gabler.
- Bardsley, P. (2001) Multi-task Agency: a Combinatorial Model. *Journal of Economic Behaviour & Organization*. 44 (2001), pp. 233 – 248.
- Caers, R., Bois, C., Jegers, M., Gieter, S., Schepers, C. & Pepermans, R. (2006) Principal-Agent Relationships on the Stewardship-Agency Axis. *Non Profit Management and Leadership*. 17 (1) pp. 25 – 47.
- Ceric, A. (2014) Strategies for Minimizing Information Asymmetries in Construction Projects: Project Managers' Perceptions. *Journal of Business Economics and Management*. 15 (3), pp. 424 – 440.
- Ceric, A. (2012) Communication Risk in Construction Projects: Application of Principal-Agents Theory. *Organization, Technology and Management in Construction. An International Journal*. 4 (2), pp. 522 – 533.
- Clipsham, P., Major, E., Bacon, L. & Manickam, P. (2011) Proposing a Multi-Agency Development Framework. *Software Quality Journal*. 19 (2), pp. 381 – 391. 4
- Cooke-Davies, T. J. & Arzymanow, A. (2003). The Maturity of Project Management in Different Industries: An Investigation into Variations Between Project Management Models. *International Journal of Project Management*. 21 (2003) pp. 471 – 478.
- Eriksson, P. E. (2016) Strategies for Reducing Moral Hazard in Construction Procurement: A Conceptual Framework. *Journal of Self-Governance and Management Economics*. 4 (1) pp. 7 – 33.

- Fenling, F. & Feiran, L. (2012) Railway Heavy-Haul Cargo Distribution and Transportation System Incentive Mechanism Based on Principal-Agent Theory. *Information Technology Journal*. 11 (7) pp. 884 – 890.
- Flyvbjerg, B. (2009) What is Megaprojects? Department of Development and Planning: Aalborg University. Flyvbjerg.pla.aau.dk.
- Flyvbjerg, B. (2014) What You Should Know About Megaprojects and Why: An Overview. *Project Management Journal*. 45 (2) pp. 6 – 19.
- Flyvbjerg, B. (2017) Introduction: The Iron Law of Megaproject Management, in Bent Flyvbjerg, ed., *The Oxford Handbook of Megaproject Management* (Oxford: Oxford University Press), Chapter 1.
- Flyvbjerg, B. Bruzelius, N. Rothengatter, W. (2003) *Megaprojects and Risk. An Anatomy of Ambition*. Cambridge: Cambridge University Press.
- Hodgson, D. & Cicmil, S. (2006) *Making Project Critical: Management, Work & Organisation*. New York: Palgrave Macmillan.
- Jensen, M. C. (2000) *A Theory of the Firm: Governance, Residual Claims, and Organisational Forms*. Cambridge, USA: Harvard University Press.
- Larson, E. & Gray, C. (2011) *Project Management: The Managerial Process*. 5th Edition. Singapore: McGraw Hill.
- Linehan, C. & Kavanagh, D. (2006) From Project Ontologies to Communities of Virtue. In Hodgson, D. & Cicmil, S. (2006) *Making Projects Critical*. (pp. 51 – 67). United Kingdom: Palgrave.
- Lundin, R. & Söderholm, A. (1995) A Theory of the Temporary Organisation. *Scandinavian Journal of Management*. 11 (4) pp. 437 – 455.
- Meyerson, D., Weick, E. & Kramer, M. (1996) Swift Trust and Temporary Groups. In Kramer, R. M. & Tyler, T. (eds) *Swift Trust and Temporary Groups. Trust in Organizations: Frontiers of Theory and Research*. Thousand Oaks, CA, SAGE Publications, Inc.
- Mitnick, B. (2013) *Origin of the Theory of Agency: An Account by One of the Theory's Originators*. Pittsburgh: University of Pittsburgh.
- Patanakul, P., Lewwongcharoen, B. & Milosevic, D. (2010) An Empirical Study on the Use of Project Management Tools and Techniques Across Project Life-Cycle and their Impact on Project Success. *Journal of General Management*. 35 (3) pp. 41 – 65.
- Robertson, S. & Williams, T. (2006) Understanding Project Failure: Using Cognitive Mapping in an Insurance project. *Project Management Journal*. 37 (4) pp 55 – 71.
- Saam, N. (2007) Asymmetry in Information Versus Asymmetry in Power: Implicit Assumptions of Agency Theory?. *The Journal of Socio-Economics*. 36 (6) pp. 825 – 840.
- Söderlund, J. (2013) Pluralistic and Processual Underestimating of Projects and Project Organizing: towards theories of Project Temporality. In: Drouin, N., Müller, R., Sankaran, S. (Eds.), *Novel Approaches to Organizational Project Management Research: Translational and Transformational*. Copenhagen: Business School Press. pp. 117 – 135.
- Steinle, C., Schiele, H. & Ernst, T. (2014) Information Asymmetries as Antecedents of Opportunism in Buyer-Supplier Relationships: Testing Principal-Agent Theory. *Journal of Business-to-Business Marketing*. 21 (2) pp. 123 – 140.
- Teo, T. & Koh, T. (2010) Lessons from multi-agency information management projects: case of the online business licensing service (OBLS) projects, Singapore. *International Journal of Information Management*. 30 (2010), pp. 85 – 93.
- Toor, S. & Ogunlana, S. (2010). Beyond the Iron Triangle: Stakeholder Perception of Key Performance Indicators (KPIs) For Large-Scale Public Sector Development Projects. *International Journal of Project Management*. 28 (3) pp. 228 – 236.
- Turner, J. R. (2004) Farsighted Project Contract Management: Incomplete in its Entirety. *Construction Management Economy*. 22 (1) pp. 75 – 83.
- Wilhelm, M., Blome, C., Bhakoo, V. & Paulraj, A. (2016) Sustainability in Multi-Tier Supply Chains: Understanding the Double Agency Role of the First-Tier Supplier. *Journal of operations Management*. 41 (2016), pp. 42 – 60.
- Wu, X., Zhao, R. & Tang, W. (2014) Optimal Contracts for the Agency Problem with Multiple Uncertain Information. *Knowledge Base Systems*. 59 (2014) pp. 161 – 172.