Institution: University of Reading

Unit of Assessment: 16 Architecture, Built Environment & Planning

Title of case study: Research informs new British Standard for construction procurement, benefitting industry and clients

1. Summary of the impact

The innovative construction procurement framework developed from research conducted at the University of Reading between 2001 and 2012, has been adopted by industry in the UK and overseas and has informed the development of a new British Standard for construction procurement. Working closely with a range of industry participants, the School of Construction Management and Engineering developed a new understanding of the costs of construction tendering and procurement. By focusing the enquiry on finance, project cash flow and the relationships between markets and business models, the research departed from previous analyses of tendering and procurement that have tended to rely on anecdote and generally accepted practice. The results led to the development of a new framework that sets procurement within a business context and explains how unnecessary tendering and procurement costs can be avoided.

2. Underpinning research

Background

A succession of major reviews of the UK construction sector over the past two decades have concluded that the ways in which construction work is tendered and procured pose major barriers to improving efficiency and performance within the industry (see National Audit Office, 2001). In particular, contractors' costs of tendering, though largely unquantified, were believed to be disproportionately high and little was known about the impact of these high costs on construction businesses. Little was also known about the circumstances in which different forms of procurement might facilitate or inhibit more general attempts to introduce innovative and effective working practices that shift the process from competitive tendering to a more co-operative and collaborative process. In 2001, a research programme, initiated by a strong consortium of construction clients, contractors, consultants and industry bodies, and led by the University of Reading, set out to explore the structure and magnitude of tendering costs and to examine more effective ways of procuring and assembling project teams, which would benefit both the industry and its clients.

Process

Fourteen leading construction and property businesses, including Amec, Balfour Beatty, Kier Group, Land Securities, and Gardiner & Theobald, actively participated in the EPSRC funded research (Section 3 [8]). The Reading team, led by Will Hughes, Professor of Construction Management and Economics (April 1989 to date), conducted in-depth interviews with the industrial participants and analysed their supply chain processes and relationships in a series of case studies. As the project progressed, the team worked very closely with industry participants that already had a specific focus on improving collaborative work and were collecting data on tendering costs. As a result, an extensive data set was obtained by integrating industry data into Reading's existing research. The Reading team used Transaction Cost Economics to develop, for the first time, a deep understanding of tendering costs through different stages of construction projects and for different tendering/procurement processes [1].

Quantifying tendering costs

The Reading team found that (a) construction companies did not monitor or assess the costs of tendering; (b) tendering costs varied widely across the construction sector, with contractors spending relatively little of their turnover on tendering (0.5-3%) while consultants spent up to 20% of their turnover on tendering [3]; and (c) there were instances where both clients and construction businesses, each with their own objectives, attempted to manipulate the market and tendering processes through power relationships [3].

These findings allowed participating construction companies to develop a better understanding of the costs associated with the tendering process, and how they could manage and reduce these costs. By focusing on transaction costs in their supply chains, contractors could, for example identify and remove non value-adding inputs. Contractors could also seek earlier involvement in the procurement process to help improve their bid success rates and the costs of unsuccessful and abortive bidding [3]. Additionally, the research provided valuable insights to the client participants about the processes of construction tendering and procurement. In particular, it showed how these processes could be designed and managed to provide more effective outcomes while avoiding the potential for manipulation by tenderers in ways contrary to clients' interests. Key recommendations for clients included the need to provide bidders with full information at the start of the tender period, and to allow sufficient time for tender preparation [2]; to keep tender lists short and manageable; to select contractors on the basis of the value they can contribute; and to standardise and simplify pre-qualification processes and documentation [3]. By providing clear, empirically-based evidence of tendering costs, the research benefits construction firms more generally by helping them to assess how tendering costs vary by project role and form of procurement.

The research was the first major attempt in the construction sector (and likely in any other major industrial sector) to quantify and assess the costs to industry of securing work through the tendering process. This work provided the empirical basis for the development of improved industry-wide guidance and standards on construction procurement.

3. References to the research

A total of 20 academic and policy papers have been published from this research. In addition, the work has been incorporated into a new national (British) standard for construction procurement. Academic papers in the selection below have been published in peer-reviewed high quality journals and have also been internally assessed as of 2* quality of above.

Key outputs:

[1] Lingard, H., Hughes, W.P. and Chinyio, E. (1998) The impact of contractor selection method on transaction costs: a review. *Journal of Construction Procurement.* **4**(2), 89-102.

[2] Laryea, S. and Hughes, W. (2008) How contractors price risk in bids: theory and practice. *Construction Management and Economics*, 26 (9): 911-924. DOI: 10.1080/01446190802317718

[3] Hughes, W.P., Hillebrandt, P., Greenwood, D.G. and Kwawu, W.E.K. (2006) *Procurement in the construction industry: the impact and cost of alternative market and supply processes.* London: Taylor & Francis. xiii + 208pp (ISBN 0-415-39560-7). Will be made available upon request.

[4] Hughes, W.P., Kwawu, W.E.K. and Hillig, J.-B. (2010) Contracts and incentives in the construction sector. In Caldwell, N. and Howard, M (eds.) *Procuring complex performance: studies of innovation in product-service management*. London: Routledge. pp 59-77. (ISBN 978-0-415-80005-1). Will be made available upon request.

[5] Gruneberg, S.L. and Hughes, W.P. (2011) Performance-based contracting. RICS Research Report. January 2011. ISBN 9781842196236. 82pp

[6] Gruneberg, S.L., Hughes, W. and Ancell, D.J. (2007) Risk under performance-based contracting in the UK construction sector. *Construction Management and Economics,*. 25 (7): 691-699.DOI: 10.1080/01446190601164097

[7] Laryea, S. and Hughes, W. (2011) Risk and price in the bidding process of contractors. *Journal of Construction and Engineering Management*, 137 (4): 248-258. DOI: 10.1061/(ASCE)CO.1943-7862.0000293

Grants:

[8] EPSRC GR/R20168/01 and GR/R20151/01 - The impact of market and supply configurations on the costs of tendering in the construction industry (PI: Will Hughes) (2001-03). £123k.

4. Details of the impact

Construction industry bases procurement approaches on research

The research has led to companies taking a new approach to procurement. Examples of this are the cases of Provelio and Balfour Beatty. Since 2008 Provelio, a Project Management provider in Property and Construction, has incorporated procurement decision models into their business practice, which allow clients to "rigorously understand what their best procurement solution would be rather than rely on traditional advice. [Provelio's] approach is based on Will Hughes' procurement framework that is reported in [2]" (section 5 [a]). Balfour Beatty has used the Reading research to explore "such issues as… transactional costs in the supply chain and the need to take non value adding tiers out of the supply chain" [b]

Research informs new British Standard for construction procurement

In 2006 the development of a new British Standard (BS) for construction procurement was seen by policy makers as key to developing better construction business practice. The idea of a new BS was supported by the Constructing Excellence Procurement Task Group – a panel of practitioners, including Hughes, concerned with the development of procurement practice guidance. By 2008 the British Standards Institute (BSI) had established a technical drafting committee for a new British Standard (BS) in Construction Procurement; Hughes was an invited member of the committee and other members were drawn from Constructing Excellence as well as the major construction professional institutions, including the Royal Institution of British Architects, Chartered Institute of Building and the Royal Institution of Chartered Surveyors. The research conducted at Reading fed directly into the drafting of the new standards through Hughes' involvement in the drafting committee [c].

Following a period of consultation with industry, the new BS on construction procurement (BS 8534:2011, *Construction procurement policies, strategies and procedures – Code of practice*) was published in August 2011. It is designed to complement a number of important international procurement standards (in particular ISO 10845, Parts 1 and 2) that have been adopted into British Standards and deal with procurement processes and documentation.

Unlike other procurement guidance which concentrates on procurement processes and selection criteria, this code is novel in the way that it concentrates on the development of procurement policies and strategies to frame the selection and appointment of the design/construction team. Additionally, it sets the procurement process within the overall project business case, and draws together and distils much of the available construction procurement guidance into a usable and practical framework.

Construction industry and clients benefit from new Code of Practice

The Code of Practice published in 2011 is used by those responsible for construction procurement in both the public and private sectors and provides a benchmark of best practice that will help in the avoidance of procurement disputes. Construction clients, in both the public and private sector, and all sectors within the construction industry have benefitted from this guidance as a result of more streamlined and effective procurement processes leading to reduced costs borne by the supply chain and improved procurement outcomes.

The reach of this project goes beyond UK construction. As a result of the research, and the publication and profile of the BS 8534, Hughes has been invited to participate in a number of influential industry and policy bodies, including:

- Member of drafting committee for the BS Publicly Available Specification (PAS) 98: Formation of consortia, 2009-10, which covers consortia in the IT domain
- Member of the Department for Business, Innovation and Skills (BIS) Construction Industry Innovation and Growth Team (Major Projects), 2009-10 [d, Pg 218].

The work has also had international impact. The Senior General Manager for Japan Post Holdings noted *"specific examples where we have been able to apply the lessons from this research [on] our major construction projects are JP Tower (new Tokyo Post Office), Nagoya high-rise building project, etc*." [e].

Reading expertise shapes conclusions of major government enquiry

Hughes' findings on the potential for bid manipulation [2] led to his involvement as a key member of the consultant team in a major government enquiry by the Office of Fair Trading (OFT). The OFT issued a Statement of Objections against 112 firms in the construction sector in England in April 2008 following one of the largest ever Competition Act investigations, which revealed illegal anti-competitive bid rigging activities on 199 tenders between 2000 and 2006. Hughes' research was cited multiple times in the OFT's Final Decision, which was published in September 2009 [f] and affected building projects across England worth more than £200 million [g]. The Director of Europe Economics, also the OFT's lead consultant on the enquiry, stated that Hughes "*provided valuable insights into construction industry business models and helped shape our conclusions".* This inquiry further strengthened the case for best practice guidance in construction procurement [h].

Additional routes to impact

Hughes and his colleagues have disseminated their research findings through numerous channels:

- Publication of results in the peer reviewed journals and in textbooks/collective volumes [1-6].
- Raising awareness in the construction sector 'trade' literature (e.g. 'Survey slams huge cost of tendering', *Contract Journal*, 21 February 2005)
- Raising public awareness more generally (e.g. Hughes was involved in a discussion on a BBC Radio 4 'File on Four' programme on construction, 10 and 15 July 2007)
- Direct involvement in policy discussions and crafting guidance (e.g. British Standards drafting committee)
- Presentation of results as keynote for international conferences, including the West Africa Built Environment Research Conference in Nigeria (24-26 July 2012).

5. Sources to corroborate the impact

[a] Letter from Managing Director, Provelio (†) corroborating overall impact of the Reading research on Provelio's work as construction project managers

[b] Letter from Business Development Manager, Balfour Beatty (†) corroborating impact on the company's approach to tendering and on the need to emphasise value rather than price.

[c] Chair of Technical Drafting Committee, CB/500, British Standards Institution (*) for corroboration of Reading's research impact on guidance and practice.

[d] HM Government (2010) *Low Carbon Construction Innovation & Growth Team Final Report* < https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/31773/10-1266-low-carbon-construction-IGT-final-report.pdf>. Evidence of Hughes' participation in this influential policy body.

[e] Letter from Senior General Manager, Japan Post Holding Co. Ltd. (†) corroborating Influence of the Reading research on the procurement practices of Japan Post Holdings.

[f] *Bid rigging in the construction industry in England,* Competition Act 1998, Decision of the Office of Fair Trading, No. CA98/02/2009 (21 September 2009), Case CE/4327-04. <http://www.oft.gov.uk/shared_oft/business_leaflets/general/CE4327-04_Decision__public_1.pdf> Cites [2] on pages 292 and 318.

[g] 'Bid rigging in the construction industry in England', *OFT, summary of the infringement* [website] <http://www.oft.gov.uk/OFTwork/competition-act-and-cartels/ca98/decisions/bid_rigging_construction#.UlXRPFAqiSp> accessed 9 Oct 2013. Gives figures that give perspective to the importance and impact of the OFT enquiry.

[h] Europe Economics (*) corroborating impact of the Reading research on, and Professor Hughes's input to the Office of Fair Trading enquiry in 2008 into bid rigging and anti-competition practices in UK construction.

(†) Letters available upon request

(*) Contact details submitted separately as per guidance