

CONSTRUCTION ENGINEERING MASTERS DISSERTATION ABSTRACT

Exploration of Conflicting Supply Chain Objectives

It is widely recognised that waste is endemic within construction, with studies indicating that only 43% of time on a project is productive. Over the last 30 years much research and policy making has focused on the complexity and fragmented nature of construction supply chains, its effect on the industry's productivity and the project management systems that seek to manage this complexity. More recently scholars have explored how individual firms, in seeking to optimise profitability, often behave in a way that conflicts with a project's needs.

It is understood that in order to be profitable sub-contract firms need to optimise labour and seek to manage projects in a way that provides continuity of work across a portfolio of projects, often at the expense of one or more individual projects. The problem is that these studies are primarily founded on the belief that people and markets behave rationally and have only focused on those sub-contractors directly employed by the main contractor rather than looking past these sub-contract firms to their sub-contractors and operatives. This study seeks to identify the behaviours of firms and people throughout supply chain in order to understand how their behaviour affects project productivity.

Behavioural data was gathered using semi-structured interviews across four case studies, with two follow up focus groups. A multi-layered supply chain was chosen comprising of firms who install and maintain building energy management systems, working back up the supply chain to the main contractor.

With little exception, all those interviewed identified examples of missed productivity with significant periods of being forced to wait. Rather than what was expected from previous work, this study identified evidence of firms not seeking to optimise labour and minimise waste but instead adopting two primary alternative strategies, 1) of gaining control of the risk and 2) of minimising the risk affecting.

In attempting to gain control of this risk contractors seek to develop deep trusted relationships with their clients to place themselves in a position to negotiate rather than competitively bidding for work. Evidence was gathered showing that this leads them to seek improvements in their profit margins through price manipulation, seemingly risking the very trust that they seek to develop.

A similarly damaging approach to minimise risk affecting them by passing it down the supply chain onto sub-contractors. A common example was for electrical sub-contractors involved in the study not to employ any electricians. Instead, it was found that labour was brought from so-called 'labour only sub-contractors' on a fixed price basis, which is inflated to include cost risk associated with waste.

The implication being that there is a market failure, the behaviours identified have some explanation in social economics and behavioural science which also provides useful insights for interventions that could change these behaviours that would support behavioural change. The scope of this study was limited to a relatively small section of the construction supply chain in the UK, further work is required to test the results across a larger sample. By understanding the limitations and behaviours of the existing arrangements, policy makers can be further supported in designing a better framework that drives improvements in productivity within the industry.

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