UNIVERSITY OF CAMBRIDGE
Department of Engineering

## CONSTRUCTION ENGINEERING MASTERS DISSERTATION ABSTRACT

# Construction productivity and its relationship to construction type, employment type and health and safety.


The construction industry is frequently faulted for being fragmented, unsafe, unproductive, and having variable/unpredictable work output. However, little is known how these factors interact with each other. This paper evaluates whether these factors are interrelated, in particular the relationships between productivity, safety, self-employment and construction type. Though significant academic research has gone into productivity factors, or the relationship between productivity and health and safety, a significant knowledge gap exists about the connection between employment type or construction type with productivity and health and safety.

The research methodology involved two phases. It began by examining UK national statistics to evaluate whether any correlations exist. Factors examined were sectional unit labour costs (to measure productivity), accidents per 100,000 workers (to measure health and safety), the number of self-employed/the number of firms with over 1200 employees (to measure employment type), and the percentage of housing/infrastructure/other construction (to measure construction type).

This was followed by a two-part survey of construction professionals (architects, contractors, consulting engineers, quantity surveyors, project managers, site engineers and tradespeople). The first part asked them to predict correlations of the factors discussed. The second part asked respondents to use a 7-point Likert scale to agree/disagree with statements about causality between these factors.

Strong correlations (both negative and positive) were uncovered from the national statistics, varying from -0.966 to 0.929 between productivity, safety, employment type and construction type. The correlations that emerged from the national statistics were not apparent to industry professionals. Those that accurately guessed correlations were limited, with a maximum of 13% of respondents accurately predicting the national correlations.

Respondents were also reluctant to assign causality between these factors. When assessing causality, those surveyed had stronger responses (on the Likert scale) to factors related to health and safety, than productivity.

The author concludes that while strong correlations exist on a national level, construction professionals have difficulty assessing these correlations, or predicting causality. Due to significant reporting/training (both corporate and statutory) around health and safety factors, construction professionals are able to assess and predict causality in health and safety better than in productivity. Since strong relationships between these factors exist on a national level, and this study was unable to uncover any causal association, these relationships should be explored further. Better understanding the relationships may allow the industry to improve productivity and reduce accidents, resulting in a healthier more sustainable industry



**Jassa Chawla**


**June 2020**