

Construction efficiency: A tale of two developed countries

The measurement of construction performance is a vexed problem. Despite much research effort, there remains little agreement over what to measure and how to measure it. The problem is made even more complicated by the desire to benchmark national industry performance against that of other countries. A research paper written by Professor Craig Langston from Bond University in Australia, which was the 'Highly Commended Winner' in the Research Paper category of the CIOB Innovation & Research Awards, introduces a new method for comparing international construction efficiency. The method has been tested on a dataset of 337 modern high-rise buildings in Australia and the USA.

Construction efficiency is defined as cost over time (i.e. \$/month). This research adopts a purchasing power approach for cost adjustment within and across countries using a unique basket of construction-specific materials, labour and plant. This basket is called a *citiBLOC*. Cost, therefore, is measured as the number of *citiBLOCs* necessary to construct a project, where the standard basket is priced in each city in local currency, removing the need to apply currency exchange rates that otherwise introduce volatility and erroneous outcomes. Construction efficiency is used to comment on the relative performance of the procurement process in different locations.

This research draws on what is understood to be one of the largest samples of construction project data ever assembled in a single study. Data comprised 337 high-rise projects of 20 storeys or more, completed between 2003 and 2012, throughout the five largest cities in Australia and the USA and representing two-thirds of the known population of such buildings in these locations. The ensuing analysis not only demonstrated the practical application of the model, but provided new insight into the efficiency track-record of the construction industry in Australia and the USA by city over a 10-year period comprising equal pre- and post-GFC (global financial crisis) data.

This research advances the notion that construction efficiency at a project level can be aggregated to determine construction efficiency of a contractor, a city or a nation. Construction efficiency intuitively assumes that issues of quality and complexity largely cancel out as increases in both cost and time



Professor Craig Langston

would normally be expected. No significant difference was observed between data pre- and post-GFC suggesting that changing market conditions did not impact on contractor efficiency levels.

A CIOB award-winning paper concluded that efficiency on construction sites had improved in both Australia and the USA over time. The growth in baseline cost/m² suggested a corresponding rise in project complexity. Despite a similar trend in efficiency improvement, there was evidence that base costs in Australia had outstripped the US, meaning that 'real' construction efficiency in Australia was relatively less. It is determined that the US has outperformed Australia in terms of construction efficiency by 1.10% pa over a 10-year period.

Professor Craig Langston's research paper was published in *Engineering, Construction and Architectural Management*, Vol.21 No.3, pp. 320-335, 2014. It is also included as a chapter in the recent book by Best, R. & Meikle, J. (eds.) *Measuring Construction: Prices, Output and Productivity*, published by Routledge in 2015.

For further information on this topic please

contact Professor Craig Langston (E-mail: clangsto@bond.edu.au) at Bond University, Australia. For further information on the CIOB International Innovation & Research Awards please contact Dr Chung-Chin Kao (E-mail: ckao@ciob.org.uk), or visit <http://iandrawards.ciob.org/>.



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E-mail: ian.forristal@raeng.org.uk
www.raeng.org.uk

RESEARCH ORGANISATIONS

Centre for Innovative and Collaborative Construction Engineering (CICE)

Loughborough University, Loughborough, LE11 3TU (01509 228549)
E-mail: S.G.Yeomans@lboro.ac.uk
www.cice.org.uk

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