



**UNIVERSITY OF
CAMBRIDGE**

Department of Engineering

CONSTRUCTION ENGINEERING MASTERS DISSERTATION ABSTRACT

Risk perception and funding of large scale construction projects

The effects of the global financial crisis of 2008/9 has led global banking regulators to reassess banks requirements for capital to debt ratios and a stricter analysis of risk nature of investments. Although, these new regulations are being introduced slowly with full implementation not due till 2016 the effects on project financing streams for infrastructure, both private and public, is being felt within the sector. Full implementation and adherence to guidelines may restrict the access to funding streams.

The need for increased funding of global infrastructure projects has been well researched and documented. The major cause of this requirement is demographic growth with potential global population exceeding 10 billion by the 2030's this combined with failure to re-invest in existing infrastructure has led to figures of a \$70 trillion shortfall. The global economy has ample funds to fill this shortfall, in excess of \$300 trillion, and it would appear that it is the risk perception and appetite of investors that is holding back many potential major projects.

Construction is viewed as a far higher risk within investors not familiar with the sectors advances in supply chain optimization, engineering / technology abilities and project management. The issue of liquidity, in comparison to other investments such as equities, if a project becomes distressed is one of the highest risk aspects outlined by the new sources of funding which needs to be addressed before large-scale funding will be released. Surprisingly little academic work has focused on this area and it is apparent from discussion with banking and financing sectors as well as central government that all players within the sector require a new model of risk allocation. By the use of concept mapping after extensive interviews with experienced actors from each element of the infrastructure supply chain it has been possible to determine a qualitative analysis of how risk is allocated and perceived within each part of the supply chain. With the greatest risk perception gap demonstrated by the new funding streams that will be required to fund the expected shortfall that has been highlighted in infrastructure spend.

The current methodologies of risk analysis in project financing is not working for new entrants although still used by existing banks who use their collective experience to comprehend the true risks associated with individual projects. This experience level is not available to new entrants so a methodology that explores in more depth and enables a greater quantification of risk will need to be developed. A model that uses both concept mapping combined with a Bayesian analysis to determine inference levels is feasible but higher levels of data gathering is required to obtain robustness.

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