

Adaptation Measures as a Response to Climate Change Impacts and Associated Financial Implications for Construction Businesses by the Application of a Mixed Methods Approach

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Abstract : It is obvious that buildings and infrastructure are highly impacted by climate change (CC). Both, design and material of buildings need to be resilient to weather events in order to shelter humans, animals, or goods. As well as buildings and infrastructure are exposed to weather events, the construction process itself is generally carried out outdoors without being protected from extreme temperatures, heavy rain, or storms. The production process is restricted by technical limitations for processing materials with machines and physical limitations due to human beings ("outdoor-worker"). In future due to CC, average weather patterns are expected to change as well as extreme weather events are expected to occur more frequently and more intense and therefore have a greater impact on production processes and on the construction businesses itself. This research aims to examine this impact by analyzing an association between responses to CC and financial performance of businesses within the construction industry. After having embedded the above depicted field of research into the resource dependency theory, a literature review was conducted to expound the state of research concerning a contingent relation between climate change adaptation measures (CCAM) and corporate financial performance for construction businesses. The examined studies prove that this field is rarely investigated, especially for construction businesses. Therefore, reports of the Carbon Disclosure Project (CDP) were analyzed by applying content analysis using the software tool MAXQDA. 58 construction companies - located worldwide - could be examined. To proceed even more systematically a coding scheme analogous to findings in literature was adopted. Out of qualitative analysis, data was quantified and a regression analysis containing corporate financial data was conducted. The results gained stress adaptation measures as a response to CC as a crucial proxy to handle climate change impacts (CCI) by mitigating risks and exploiting opportunities. In CDP reports the majority of answers stated increasing costs/expenses as a result of implemented measures. A link to sales/revenue was rarely drawn. Though, CCAM were connected to increasing sales/revenues. Nevertheless, this presumption is supported by the results of the regression analysis where a positive effect of implemented CCAM on construction businesses' financial performance in the short-run was ascertained. These findings do refer to appropriate responses in terms of the implemented number of CCAM. Anyhow, still businesses show a reluctant attitude for implementing CCAM, which was confirmed by findings in literature as well as by findings in CDP reports. Businesses mainly associate CCAM with costs and expenses rather than with an effect on their corporate financial performance. Mostly companies underrate the effect of CCI and overrate the costs and expenditures for the implementation of CCAM and completely neglect the pay-off. Therefore, this research shall create a basis for bringing CC to the (financial) attention of corporate decision-makers, especially within the construction industry.

Keywords : climate change adaptation measures, construction businesses, financial implication, resource dependency theory

Conference Title : ICBDECC 2019 : International Conference on Buildings, Design and Climate Change

Conference Location : Amsterdam, Netherlands

Conference Dates : February 07-08, 2019