



**The Hong Kong University of Science and Technology**

**Department of Mathematics**

**PhD THESIS EXAMINATION**

***Firm-Level Climate Risks: Measurement and  
Asset Pricing Implication***

*By*

**Ms. Tingyu YU**

**ABSTRACT**

We construct various measures of firm-level climate risk exposure by utilizing natural language processing techniques on firms' quarterly earnings conference call transcripts. The unsupervised learning method automatically generates five topics, all aligned with popular concerns about climate change. Investors reward firms' efforts to actively fight against global warming and transit to a low-carbon economy. Such firms are less sensitive to the frontier green technology shock and also less likely to be subject to risk associated with litigation and penalties related to environmental issues. Therefore, they have a lower cost of financing and expected return. On the other hand, disaster has a significant negative association with firms' sales growth and profitability. Firms with higher disaster exposure tend to earn higher expected stock returns than those counterparts with lower exposure, suggesting that firms' disaster risk exposure significantly affects the cost of equity and market valuations. A long-short portfolio based on this exposure measure generates a positive return of 5% per annum, which cannot be explained by common risk factors and other firm characteristics.

**Date : 23 June 2022, Thursday**

**Time : 3:00 p.m.**

**Venue : Online via ZOOM**

**ID: 527 127 4670 (Passcode: 821643)**

**<https://hkust.zoom.us/j/5271274670>**

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*(Open to all faculty and students)*

The student's thesis is now being displayed on the reception counter in the General Administration Office (Room 3461).