

## The Cost of Climate Adaptation for the Listed Companies in the Stock Market

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Climate change is an important factor that directly affects in the agriculture. Therefore, to adapt with the climate change, agriculture and plantation firms need to take different initiatives and spend in many ways. If the firm is enlisted as a public listed company, it needs to bear adaptation cost in physical level, accounting level and stock market level. In the stock market, investors expect risk premium in order to accept the higher fluctuation or volatility of the stock price. As climatic events have direct adverse impacts on the financial performance of agro and plantation companies, it also increases the business risk for these companies. Therefore, to maintain stability in price, higher equity market risk premium and/or higher dividend is required. This extra risk premium and extra cost of equity, dividend, can be considered as the climate change adaptation cost at stock market level. This cost helps agro and plantation companies to maintain performance at stock market level. Therefore, to understand the climate change adaptation cost for stock market performance of public listed agro and plantation companies in Malaysia, this study empirically investigate four specific objectives – (i) examine the impact of climate change on stock market price volatility (market risk), (ii) find out the equity market risk premium (market return) for climate change events, (iii) examine the impact of climate change on the cost of equity (dividend), and (iv) find out the reflection of climate change on the stock market investor's behavior. To fulfill the first and third objectives, the firm level data were collected for 33 Malaysian public listed plantation companies from 2003 to 2016. For the climatic variables, both models considered El Nino and Flood, and panel regression models were used to draw inferences. For the second objective, this study conducted event study based on El Nino events that happened from 2009 to 2018. The firm level daily stock price data for 37 companies, market index data, plantation index data, and El Nino data were analyzed to determine risk, return and risk premium for the El Nino events. To fulfill the fourth objectives, a structured questionnaire survey was conducted among the individual investors in Malaysian Stock Market, Bursa Malaysia. To draw inferences this study estimated Structural Equation Model based on 273 samples. The overall findings show that climatic events are long term phenomenon which has not adequate and significant instant impact on the stock price or market return. However, investors are aware about the negative impacts of climate change on the annual return of the company, and they expect compensation for the climatic risk. Therefore, public listed companies compensate the investors through providing higher dividend in the adverse climatic event year and it also help them to maintain stability in stock price. The findings of the study will help the investors, companies, regulatory agency and policy maker to improve the market efficiency and to achieve the UN target of sustainable stock exchange initiatives.

**Keywords:** Stock price volatility; Stock market return; Cost of equity; Dividend payout; Investor's behavior; El Nino; Flood; Plantation company; Bursa Malaysia