

Title: Hedging Drought Catastrophic Risk Using Weather Derivatives: A Case on Large Scale Wheat Farmers in Narok, Kenya

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Abstract

This research aimed to demonstrate that a weather derivative could be used by large scale wheat farmers in Narok to protect themselves against the adverse effects of drought. This involved determining the possibility that index based weather derivatives could be used to hedge against drought catastrophic risk. In this case, a drought put option contract was considered as the desired weather derivative. The methodology stipulates the empirical strategy with the study considering rainfall (precipitation) and temperature data from Narok County over a period of 20 years from 1994-2013. Data from 1993-1994 was provided by the Kenya Meteorological Department (KMD). Narok was chosen as the study area as it is the highest net producer of wheat in Kenya and has previously been adversely affected by droughts. Both rainfall (precipitation) and temperature were assumed to follow mean reverting processes. The results and analysis shows how these stochastic models were used to estimate the value of evapotranspiration and the speed of monthly rainfall, needed to estimate a drought index based on the Reconnaissance Drought Index (RDI). This value was then used to price drought option contracts over the sample period, whose pay off's were the difference between the strike price K , given as the aridity index for Narok based on (Zhu, Ringler, & Okoba, 2011) and the value of the RDI. From the study's discussion and conclusion, it was established that put option contracts would provide farmers with a positive pay out and hence, effectively hedge against drought catastrophic risk. However, it is recommended that further research should be done to create a standard way of valuing weather derivatives with emphasis made on eliminating spatial basis risk.