

Securitisation and Pricing of Flood Insurance: A market consistent approach

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Abstract

The idea in this paper was conceived in 2003 when severe floods in Kent, England, triggered many insurance companies declared large residential areas in the region as uninsurable zone. For the individual household actors in the economy, this is a classic example of market breakdown. Here, we show one way to price flood insurance that is consistent with pricing theory that is fundamental in Finance. In this framework, market is complete in which a pricing kernel exists. With the assumption that floods can be modelled using rainfall data, prices of flood insurance cover can be priced as options on a transformed gamma distribution. The resulting pricing formulae is closed form and preference free. To make our pricing framework market consistent, an asset specific pricing kernel can be inferred from prices of insurance contracts of household in other part of the country. Using rainfall precipitation data for England and Wales from 1766 to 2007, collected from UK Met Office, we demonstrate the flexibility of the transformed gamma option pricing model in pricing different types of flood driven payoff functions.

Keywords: Catastrophe insurance, transformed gamma distribution, pricing kernel.

JEL classification: G12, G13, G22.

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