Testing for Myopia and Amnesia in Property Prices. The Case of Infrequent Floods

Alicia N. Rambaldi
The University of Queensland
Email:a.rambaldi@uq.edu.au

Kumudini Ganegodage
The University of Queensland

Cameron S. Fletcher
CSIRO

Ryan R.J. McAllister
CSIRO

In this paper we explore the relationship between flooding events and the patterns of discounting of property prices. We develop an estimation and testing strategy to implement a recently proposed theoretical framework and use a unique natural experiment to demonstrate how this framework provides a test for myopic and amnesic responses to flooding frequency and severity in urban property prices.

Infrequent floods is where myopic and amnesic perceptions of risk should dominate. In this regime observed quality adjusted prices are expected to drift away from a risk-adjusted constant quality property price towards the zero-risk constant quality property price as the years pass since the last flood. When a flood occurs, actors become aware of the true flood risk and observed prices quickly adjusts downwards towards the risk adjusted price.

We define empirical versions of the zero-risk threshold (P(ZR)) and the actual quality adjusted price (P(A)) as functions of hedonic price indices. The risk-adjusted constant quality price (P(RA)) is obtained via hedonic regressions and a difference-in-difference estimation. To test the hypothesis of amnesic and myopic behaviour in property prices, we construct an empirical distribution of P(A) using a bootstrapping approach. We use the confidence interval to test hypotheses of \'no amnesia\' and \'no myopia\' in property prices. If the distribution of the bootstrapped P(A) includes P(ZR) we reject the null hypothesis of \'no myopia\' and conclude there is evidence of myopia. Similarly, we reject the null of no amnesia if following a flood event the bootstrapped distribution goes below the P(RA) and then recovers to levels above P(RA).

The city of Brisbane suffered two major devastating floods in 1974 and 2011. The construction of a dam with two compartments, flood and water reservoir, in the mid 1980s lead inhabitants and the market to underestimate the risk of another major event after that of 1974. Our dataset covers property transactions for an inner Brisbane (Australia) area located 5 km from Brisbane Central Business District(CBD) with 30% of each year\'s sales being properties in the flood plain (defined by the 2011 flood) and with proximity to a waterway within the tidal reaches of the Brisbane River. While minor flooding directly impacts only very few properties, the visibility of swollen waterways can provide reminders of flood risk in between major events. This ideal setting allows us to test for myopic and amnesic behaviour for this area over the period 1990-2015. We find strong support for the behaviour and discuss some of the implications for public policy.