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## ***Interactive comment on “Factors affecting flood insurance penetration in residential properties in Johor Malaysia” by U. Godwin Aliagha et al.***

**U. Godwin Aliagha et al.**

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Response to Referee 2

Interactive comments on “Factors affecting flood insurance penetration in residential properties in Johor Malaysia” by U. Godwin Aliagha et al.

Dear Referee, Thank you for your constructive comments and observations on our paper. We really appreciate them and have incorporated your views in the revised manuscript. Below is our response to your comments.

Comments: Section 3.1: Why only 207 questionnaires were used and not 315? There is no explanation. Response: 315 questionnaires were distributed, but 135 were re-

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ceived, 80 were not returned. Out of the 135 received, 28 were rejected because of incomplete response. The remaining 207 were used for the analysis.

Comments: Section 3.2: Subject risk perception item (3)(4)(5)(6): why likelihood of dropping insurance is chosen to represent 'subjective risk perception'? Same question for all other questions that follow. This doesn't make sense. Response: The items were chosen to represent subjective risk perception because 1] they reflect subjective risk judgements and values, and 2] there were literature supports for them. For example item [3] "likelihood of dropping flood insurance if flood is not experienced for 2 year" reflects the respondents perceived judgements of the immediacy of the flood and effect. That is the extents to which the homeowners perceive the risk of flooding to be reoccurring soon or not affect their decision to renew or purchase flood insurance. In our literature review, page 3074 (supplementary manuscript) lines 12 to16 we noted that the time of last flood has been observed to have an influence on the decision of a homeowner to purchase insurance. Not experiencing flood damage for several years has led to decline in renewal rate for policies in comparison to other types of insurance coverage (Kunreuther & White 1994, Palm 1991).

Similarly, item [4] "perceive flood insurance premium to be high but willing to pay slightly higher than fair price" reflect subjective risk judgements and values of modest risk individuals to go beyond linear standard rationality that prefers actuarially fair premium to more realistic world situation and accept premium slightly fair price. This was supported by prospect theory in page 3071, line 26 to line 2 of page 3072 which postulates that people, including modest risk individuals are willing to take an additional risk by paying more in order to avoid loss. In support of this postulation, studies by Pashigian et al.,1966; Drèze, 1981; Cutler and Zeckhauser, 2004; Kunreuther and Pauly, 2006a; Sydnor, 2010; Ulrich, 2012 reveal evidence of modest risk people often buying insurance policy with premiums significantly exceeding expected losses.

In the same vein, items 5 and 6 reflect subjective risk judgements. For example, item 6, "perceptions that flood protection system are not adequate" reflect how the respon-

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dents perceive the existing structural flood control measures, such as dykes, levees, floodwalls, reservoirs, and bypass channels. There was literature evidence in page 3074, lines 18 to 26 that perception of structural stability of flood protection measures influence decision to purchase flood insurance cover.

Comments: The question is on whether respondents had flood insurance or not is problematic. Is flood cover in Malaysia a standalone product or part of home insurance package? if so you should have asked whether current policies have flood cover or not. Response: In Malaysia flood insurance is optional under home insurance. Under the package home owners can choose insurance cover for building only, or contents only or building and contents.

Comments: The meaning of 'flood insurance' is quite ambiguous when directly put in questionnaire. Also, do people in Malaysian have full access to flood cover? Often it is a matter of availability (i.e. insurance companies refuse to offer flood cover to high risk households). If this is the case, such question about purchasing behaviour should be triangulated by other indicators, such as whether respondents want to buy flood cover. Response: Malaysians do not have full access to flood cover. We agree that availability is central to the problem and insurance companies often refuse to offer flood cover to high risk households. We recognised and implied this in page 3067 where we noted that property owners in high-risk areas to expect premiums double in the coming as the insurance firms operating in these areas experience cost of cover rise by as much as 100% in the next 10 yr (Gerrit, 2009). Our result also highlighted this in page 3086, line 7 where 7% the group that do not have flood insurance stated the refusal of insurance companies to cover property as their main reason for not having flood insurance.

In framing the scope of our paper in page 3069, line 19 we noted that “residential flood insurance penetration requires both demand and supply sides. The demand side is determined by the households while the supply side is mainly controlled by the insurance firms. Our study focuses on the demand-side aspect of residential flood insurance”. Thus, while acknowledging that residential flood insurance availability requires both

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demand and supply sides, we stated that our paper focused on demand side and not on the supply sides. More so, in our concluding statement in page 3088 line 3 we stated that against the backdrop that some homeowners stated that they do not have flood insurance because insurance companies refused to issue them cover, we commended for further investigation into reasons insurance firms are reluctant to provide flood insurance and examine ways to sensitize and incentivize them to provide cover.

We did not ask our respondents whether they would want to buy flood cover because we expect the answer to be overwhelmingly yes. Rather, we further asked those that indicated that they did not purchased flood insurance the reasons they have for not purchasing flood insurance. The responses to this question were presented in figure 1. In our opinion this question is more useful than asking the respondents whether they want to buy flood cover.

Comments: Section 3.3: how random was the sampling scheme? How was it 'self-administered'? Sampling strategy is not explained. Response: The sampling strategy was based on two stage stratified sampling scheme involving primary and secondary sampling units in each on the districts. Based on this design, 315 samples were selected from an estimated number of 45000 owner occupied residential houses within 7 kilometres of major river flood plain in each of the districts. Self administered means the questionnaires were handed to the respondents face-to-face. However, the respondents who had no time to complete the questionnaire either immediately or after second appointment were given self-addressed envelope with stamp to return the questionnaire.

Comments: Tables could be presented in a reader-friendlier format. Please consult other published studies. Response: We have amended the tables in the revised version of the manuscript.

Comments: Please double check references. For example Bubeck et al (2012) was not cited correctly in text. Response: We have corrected this in the revised version of

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the manuscript.

Comments: Lots of mistakes in grammar and sentences please proofread carefully.  
Response: The manuscript has been proofread and the errors corrected in the revised version of the manuscript.

Thank you and kind regards

Dr. Godwin U. Aliagha

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Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 2, 3065, 2014.

**NHESSD**

2, C2155–C2159, 2014

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