Nat. Hazards Earth Syst. Sci. Discuss., 2, C1722–C1725, 2014
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Natural Hazards and Earth System Sciences
Discussions

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

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Received and published: 28 July 2014

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

Dear referee, I wish to express my deep gratitude for your valuable observations and comments on our paper. Your expert comments have greatly enriched the quality of our paper. In the following section we have provided reply to all your minor and major comments:

Minor Comments 1: There are many typos in the text of the manuscript (see the highlighted text in the supplementary PDF) that should to be corrected. Response: All the typo errors have been corrected. Please see attached manuscript for the corrections.

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Interactive Discussion

Discussion Paper

Minor Comments 2: There are also several statements made that need to be better motivated. This is because at a glance these statements are not unambiguously true (see comments in the supplementary PDF). Response: We have made some amendment to statements and provided better clarifications to each of the statements. Please see attached manuscript for amendments.

Minor Comments 3: results of table 2 seem counter intuitive. This could be corrected because the dependent variable is of non-standard construction (2= no insurance, 1=has insurance), if the assigned values are reversed the estimated values would be more intuitive (the correlations would only change direction). Response. In dicriminant analysis, it is standard method for denoting nominal dependent grouping variable. Our study involves a two group discrimnant analysis which the grouping variables can be represented as: a) 0 and 1 or 1 and 0; or b) 1 and 2 or 2 and 1. This is often a requirement and has to be provided in the definition of group range. Reversal of the values may not make much observable difference or affect the interpretation of the result as the prior probabilities for classification and derivation of group centroids and function were based on group sizes which in the present study are 72 for those that has flood insurance represented in the grouping definition as 1 and 135 for those that do not have flood insurance represented in the grouping definition as 2.

Minor Comments 4: I would suggest replacing the word “penetration” in the title with “purchase”. Response: The word “penetration” in the title has been replaced with the word “purchase”.

Minor Comments 5: It may also be useful to clarify which of the two objectives is the more important one and use this to streamline and focus the paper on this objective. Response: We have made minor amendment on the wordings of the objective 1 to reflect the focus of the study. However, we prefer not to specifically state which of the objectives is more important particularly if we have achieved the objectives.

Major Comments 1: There is no discussion on the underlying assumptions required for

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the use of discriminant analysis as the statistical tool. Response: This is a big omission in manuscript and we thank you for spotting it out. A major condition for application of discriminant analysis is meeting assumption that the variance-co-variance matrices are equivalent for the groups. This is often verified by Box's M test of the null hypothesis that the covariance matrices do not differ between groups. The result of M Box values shows that our data met this condition; hence the hypothesis that the groups do not differ was accepted, implying is appropriate to apply discriminant analysis. Please note: In Box's M test researchers look forward to accepting the null hypothesis if the assumption is to be met. This is different from the traditional hypothesis where researchers look forward to rejecting the null hypothesis. We have included this aspect in our manuscript. Please see page 3078 of the attached manuscript.

Major Comments 2: A deeper discussion of the mechanics or practical nature of discriminant analysis, I feel would also be useful for the paper, as I cannot recall another paper in this topic using the same method. Response: We have expanded our discussion on discriminant analysis and included relevant equation for expressing it to accommodate practical understanding of nature of discriminant analysis. We will include this in the final version of the manuscript.

Major Comments 3: I also believe that the paper's investigation into insurance penetration rates could be better supported by the discriminant analysis if this is the true objective of the authors. For example, once the variables have been ranked maybe the differences in the average person in each region to see if this helps to explain, informally, why the penetration rate differs between regions. Response: Obviously it would have been appropriate to do this but the sample size for each of the regions is too small to run a separate discriminant analysis for each the three regions. Larger data set for each district region will be required to carry out a meaningful discriminant analysis on district basis as well to test for the assumption or condition of equal variance-covariance matrices. We have taken this as a major limitation of the study which we will include this in the final version of the manuscript.

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Major Comments 4: why protection motivation theory based variables are not included, and an improvement of why prospect theory is focused upon. Response: Absolutely, protection motivation theory is an interesting theory that would have fitted the study as well but we chose prospect theory because it seems more popular in explaining decisions under risk and uncertainty and more so, it particularly captures the perspective of risk aversion. Having said that we have an ongoing study in which we are incorporating protection motivation theory based variables.

Major Comments 5: It might also be an interesting addition, as far as possible, to discuss if the results hold closer to prospect theory for expected utility theory Response: In the light of the findings, it is pertinent to say our results hold closer to prospect theory than for expected utility theory. Please see attached manuscript, page 3088 where we have provided bases for this.

Once more, we treasure your observations and insightful comments

Thank You

Please also note the supplement to this comment:
http://www.nat-hazards-earth-syst-sci-discuss.net/2/C1722/2014/nhessd-2-C1722-2014-supplement.pdf

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