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Discussions

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Interactive comment on "On the role of building value models for flood risk analysis" *by* Veronika Röthlisberger et al.

Anonymous Referee #1

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Dear authors, thank you very much for this interesting contribution to NHESS. The paper addresses the problem of how to estimate asset values of buildings, which can be further used as input for exposure analyses and finally for (flood) risk analyses. Exposure analysis is often neglected in the scientific literature. Therefore, this detailed investigation is highly appreciated.

Taking Switzerland as an example, five models to estimate building values were derived and compared to a comprehensive set of insurance data as well as to a benchmark model (model 5). The five models require different data inputs ranging from simple information, e.g. average value per building or per unit of a specific land use category, to data containing different features (e.g. volume) of individual buildings.

The investigation is straightforward and the findings and conclusions are quite clear.

Since all five models reveal similar spatial pattern of asset values throughout Switzerland, a simple model, e.g. based on land use units, can be used for a countrywide screening of protection needs or prioritisations of regions. However, when it comes to a quantification of costs and benefits of risk reduction measures simple approaches tend to underestimate asset values and therefore project benefits. Therefore, such estimations should preferably be based on individual buildings.

While the paper is in general clearly written and presented, I would like to raise to a few topics of concern:

1) In the introduction, a more general discussion about valuation methods and their application fields is missing. Commonly, approaches based on replacement values are distinguished from approaches that rely on depreciated values. Insurance values or market values can be used to approximate one or the other. A distinction of these approaches and their application fields (e.g. insurance claims, cost-benefit-analysis) should be added. This issue should also be reflected later in the discussion. In the current paper, this issue is only very briefly mentioned in section 2.4.1, which is late and not sufficient in depth.

2) The five models are well explained, but the rationales/justifications behind these models remain unclear. Please add some more background and assumptions about all models. Tab. 1 provides a comprehensive overview, but needs in my view more explanation in the main text. The same holds for Fig. 1.

3) The authors find big differences between the Swiss unit costs and other published unit costs and explain this by differences in building standards and higher construction costs in Switzerland. It would be helpful to add some additional (real) data or statistics that underpin this explanation.

4) An overview table with advantages and disadvantages of all five models and their suitable applications would be helpful to summarize the findings (as a kind of counterpart to Table 1).

5) The conclusion should end with an outlook on future research perspectives. (The implications of the results are addressed sufficiently.)

A few minor comments are:

1) In the introduction, a few important papers in this field are missing from my point of view, e.g.:

- Barredo, J. I. (2009): Normalised flood losses in Europe: 1970–2006. - Nat. Hazards Earth Syst. Sci. 9: 97-104.

- Jongman, B., Koks, E. E., Husby, T. G., and Ward, P. J. (2014): Increasing flood exposure in the Netherlands: implications for risk financing. - Nat. Hazards Earth Syst. Sci. 14: 1245-1255.

- Kleist, L., A.H. Thieken, P. Köhler, M. Müller, I. Seifert, D. Borst, U. Werner (2006): Estimation of the regional stock of residential buildings as a basis for comparative risk assessment for Germany. – Nat. Hazards Earth Syst. Sci. 6: 541-552.

- Seifert, I., A.H. Thieken, M. Merz, D. Borst, U. Werner (2010): Estimation of industrial and commercial assets values for hazard risk assessment. – Natural Hazards 52: 453-479.

2) Instead of "annual expected loss" either "expected annual damage" (EAD) or "average annual loss" (AAL) should be used.

3) All abbreviations should be explained in the text once (e.g. AIC).

4) The hazard levels (high, medium, low) should be explained for readers who are not familiar with the Swiss hazard zones.

5) The correctness of the terms "global sums" or "global values" in section 3.4 should be checked. These sound a bit weird in this context.

I am looking forward to the revised version.

NHESSD

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