

We are grateful to the referees for the detailed review of our paper, insightful comments and constructive suggestions. We have thoughtfully revised the manuscript so as to satisfy the reviewers' requests. We acknowledge that the paper has improved both in structure and presentation as a result of the revision. Below we include detailed response to reviewers' comments and suggestions:

Referee n.1

Comments:

'This is an interesting topic - it is very relevant to elaborate how existing disaster insurance and the policy frameworks can be reformed in order to aid risk reduction and adaptation'.

Thank you for sharing our view on the importance of the topic.

'The authors attempt to approach the question of disaster insurance from a new angle, the legal perspective, which deserves a lot of credit. However, I am struggling with the structure and lack of analysis. The nature of the paper descriptive, it really lacks an analytical approach. This may be intended or not - but I think the value and contribution of this piece could be enhanced if it would offer some clear analysis'

Our article was born out of recognition that disaster risk insurance and financing are influenced - directly and indirectly - by a large body of existing European legislation. Yet despite that, there is remarkable paucity in scientific literature on this topic. Moreover, the 2013 Green Paper (GP) on the insurance of natural and man-made disasters (EC, 2013) posed questions as for whether or not a concerted action at the European level was warranted, but without exploring the instruments and mechanisms already in place that can help to increase the financial protection of citizens. The received responses to the GP-initiated consultation cautioned against harmonising the regulation on natural hazard insurance across the EU (EC, 2014). Both, the uneven-distribution of hazard risk and the diversity of economic standing and requirements of the customers have been brought up by the UK Government, and echoed by others, as reasons against an EU intervention (HM Treasury, 2013). The Dutch government underscored that a concerted EU action in this policy area was neither warranted nor in line with the subsidiarity principle of the EU governance (NL, 2013).

The scope of our paper is first to reconnect the multiple but fragmented discourses and sketch-out the policy landscape relevant for the discussion set-off by the GP. For that reason the paper is initially descriptive in nature, meant as an overview of the EU legal backdrop for natural hazards insurance, and including selected examples from MS that may help to understand a rather complex setting.

Second, the discussion about financing of catastrophe risks increasingly focusses on the Public-Private Partnerships (PPP) as a role model for a joint bearing of responsibilities and efficient risk-sharing, intentional of increasing insurance coverage and penetration, and guaranteeing a strong financial backing in view of uncertain tail distributions of risk. Therefore, our second aim is to explore the normative ground on which such partnership rely or should rely according to the EU legislation.

Our revision has attended to your comments, as also explained below, by making the above quest explicit from the onset of the paper and by adapting a structure that is more conducive to our aims.

'In it's current format this is a document aimed at and useful for decision makers who want to be briefed on the legal backdrop, but it does not offer the necessary scientific analysis'.

We agree (see also previous answer). An in-depth policy analysis would necessarily have to be more narrowly focused and ideally accompanied through an analysis of how the European legislation is transposed to legislative framework in a selected member state of the European Union, and complemented with national laws and regulations. We are working on a similar analysis but in the context of a different scientific article.

'Some suggestions on how to improve this: - start with a clearer research question/hypothesis -explain where within the different disciplines (economics, law, political science etc.) this is grounded and what method/approach it uses. -reflect on the key issues currently relevant for disaster insurance: role of public/private, affordability, availability, climate change. -the insurance schemes currently in operation across Europe are very much national affairs. EU policy is of relevance, but not key. This aspect should be discussed and elaborated to a greater extent. Some form of display on the different levels of governance / jurisdiction would add some clarity'.

We agree that the European legislation sets the stage for, but does not determine the way disaster insurance and PPP for catastrophe risk financing are managed on the ground. In the revised introduction and the conclusions we explain this argument in depth. Furthermore, we have better contextualized the discussion about the affordability and solvency.

In the same vein we have:

- improved the discussion about the risk-policy interaction in the context of EU legal backdrop, with a focus on the tradeoff between insurance uptake (determined by premiums and affordability) and solvency (determined by risk trends);
- better defined and clarified along the paper the discipline on which this work is grounded, i.e. a EU regulatory setting review (law) and, in the new version, an assessment of the impact that incentives stemming from the EU legal backdrop may have on uptake and solvency (economics);
- strengthened the relevance of the key issues you mention (namely, public/private role, affordability, availability/solvency, climate change) along the text.

The paper has a focus on EU regulatory framework and MS regulation is not systematically analysed, except for some illustrative examples.

'It would be good to see more references to the interplay between the risk/policy landscape and risk trends (what is driving what, does the existing political framework factor in changing risk levels etc.). The paper provides an overview of PPPs as well as existing policies in the EU, however there is a lack of logic narrative that explain why those different instruments/policies have been chosen for the paper. The main current weakness arises from the fact that it does not offer the needed discourse in light of the existing literature. The concluding Policy Guiding Principles are somewhat removed from the earlier part – and there is not enough weighing of the arguments before concluding with those recommendations'.

In the revised paper we have better elaborated and summarized the policy guiding principles (PGP), to the level that is possible to reconnect with the analyzed legislation. There is extensive literature on the best practices or normative principles of PPPs which are however appropriate during the implementation phase but not stone-casted in the policies themselves. We have better specified and explained the choice of policies addressed in the paper, and connected the review and description to the PGP.

Referee n.2

'The paper "Partnership for affordable and equitable disaster insurance" provides i) a very detailed review on the legal background around the insurance instruments against natural disasters that contemplate the partnership between private and public sector for EU countries; ii) in the words of authors it offers concise policy guiding principles. More in detail, the extensiveness of this paper allows to address several issues related to the legal background that rules the provision of insurance such as the policy context, the public/private partnership, the insurance market regulation, state aid, solidarity, and civil and environmental liability'.

Thank you, our aim was to include a systematic overview of the policies that govern the definition of public-private partnership (PPPs) especially for catastrophic risk insurance and financing, as well as the policies that further encourage, limit or dissuade from this scope.

'My general impression is that there is a need for papers aiming at providing an overview of the legal background of the insurance sector for natural disaster, since it is a field very alive in this moment. However, this is an aspect not very well discussed in this version of the work. Indeed, there is the need to address several issues that, at this moment, make the paper hard to digest'

Thank you for sharing our view on this matter. We agree that the paper covers many areas that are typically not thought as contributing to the same end and the readers may be interested in one but not the other topics. We hope our revision have made the paper easier to read through.

'The title is quite cryptic and it does not allow for a precise configuration of the paper, I suggest a reconsideration of it'

We have not yet found a better title but are considering different options.

'The work lacks of a precise structure and, in this version, it is very difficult to read and it is very hard to find a clear research idea as well. So far, it looks like a list of concepts not very well interconnected among them. This structure makes the paper difficult to read and sometimes boring. For instance: Section 5, Section 6 and Section 7 might be condensed in a shorter single section. Moreover, is it really important to leave the part on solidarity (at least in the view of public-private partnership)? Furthermore, Section 3 is very long and sometimes I got lost in the story. To overrule this issue, I suggest a massive use of tables: for instance, a Table may summarize the main characteristics of PPP in section 3. The same approach could be repeated throughout the paper'

The section 5, 6 and 7 are important for the scope of systematically covering the various policies that shape – directly or indirectly – the catastrophe disaster insurance. The section 5 addresses the state aid regulation that is an important element for the design of PPPs. To better make the point, we have included an example of the Flood Reinsurance Scheme (FR) in UK. The example examines the EC decision on the compatibility of the FR with the single market competition. The UK government has notified the Commission about the planned scheme in November 2014. The notification was compulsory because the FR scheme, essentially a not-for-profit flood reinsurance fund that will be owned and managed by the insurance industry, is contingent to a levy by all homeowners who subscribe a home insurance policy.

Section 6 discusses the notion of Solidarity in the EU legislation, especially in the case of large disaster strike (see also further down for the comment on whether the recent financial crisis is important in this context). The existing solidarity-unfolding instruments such as the European Solidarity Fund (EUSF) or the European Stability Mechanism (ESM) are relevant for the scope of our article insofar they either are perceived by insurance companies as precluding a public-private partnerships for risk financing as in the case of EUSF, or create new opportunities in the field of sovereign risk insurance. We have revised the text to make the arguments stronger, and revised the structure accordingly.

'The authors do not meet all the objectives listed in the paper. Particularly I refer to the assessment of the implications of the reforms and to the aim of offering concise policy guiding principles. On this regard, both the aims are quite hidden in the paper (I found policy-guiding principles mentioned only in the conclusion and the assessment of the reforms in sentences scattered throughout the paper). I suggest a revision of the aims of the work. A dedicated section on them would be appreciated'

We have revised the text and sharpened the guiding principle as explained earlier in this note (please see the last response to Referee n.1).

'The paper sometimes covers issues at European Union level (as for PPP) and sometimes reports comparisons between legislations of Member States. I suggest "homogenization of the treatment" meaning that EU legislation should be primary quoted and then it might be interesting to make examples coming from concrete cases of the Member States (at least in few cases)'

We agree, the cases are brought in only to demonstrate the specific challenges in practical cases. The structure will be homogenized and examples will be systematically presented after introducing EU legislation.

'Page(P) 4798, Lines(LL) 20-22. Please clarify the concept of progressively fat tailed probability distribution (notice that, although the journal's readers own technical expertise, many others readers might be interested in reading the article because of the legal perspective of the topic, i.e. lawyers, policymakers and so on)'

We have revised the text to make the point better understandable. The stochastic nature of disaster risk with uncertain tail distributions and rather partial observation of past disaster damage and impacts makes it difficult to determine the loss exceedance curve. Climate change is likely to increase the frequency of some weather and climate related extreme events. This is what we have meant by progressively fat tailed probability distributions.

'P.4799, LL. 12-14 Please explain better the concept of low probability – high impact and the link with insurance'.

We refer to low probability – high impacts type of events for situation that is also sometimes referred to as intensive risk (UNISDR, 2009). We have explained the terms in the revised manuscript.

'P.4801 L. 10. Please explore the link between damage and losses'.

We use the term '*damage*' for indicating economic value of damaged physical assets and '*loss*' as a term that stands for full economic costs of disaster that includes, but is not limited to, the production losses due to business interruption without any material damage. We have explained the terms in the revised manuscript.

'P. 4802 LL. 2-5 The current financial crises should be marginal here, or at most you could mention as a tighter constraint. PPP should hold even without financial crises'

We disagree on this point. The financial crisis has tightened the public spending and hence further intensified the search for risk financing including through the PPPs. On opposite side, the outburst of the sovereign debt crisis in several countries of the Eurozone (Lane, 2012) brought the pledge to solidarity to the centre stage of the European Union's (EU) political agenda (Kontochristou and Mascha, 2014). Amidst the immense turmoil in financial markets, and to prevent contagion to the rest of the Eurozone, the (at that time) seventeen Eurozone countries created the European Financial Stability Facility (EFSF) with reference to the Article 122 of the Treaty on the Functioning of the European Union (TFEU) pledging financial assistance, 'in a spirit of solidarity', to member states 'in difficulties or is seriously threatened with severe difficulties¹. The Article 122 implies force-majeure events, and mentions explicitly natural disasters and other exceptional conditions as triggers. In meantime the EFSF has been replaced by other instruments that we discuss in another article. However, the debate about how the catastrophe disaster risk should be financed and what assistance should/could be provided at the EU level is highly relevant also for the scope of our article.

References:

¹ The exact wording of the Article 122 TFEU states as follows (emphasis added): [1]. *Without prejudice to any other procedures provided for in the Treaties, the Council, on a proposal from the Commission, may decide, in a spirit of solidarity between Member States, upon the measures appropriate to the economic situation, in particular if severe difficulties arise in the supply of certain products, notably in the area of energy. [2] Where a Member State is in difficulties or is seriously threatened with severe difficulties caused by natural disasters or exceptional occurrences beyond its control, the Council, on a proposal from the Commission, may grant, under certain conditions, Union financial assistance to the Member State concerned. The President of the Council shall inform the European Parliament of the decision taken.*

EC: Green Paper on the insurance of natural and man-made disasters. COM(2013) 213 final, 2013.

EC: Summary: Responses received to the European Commission's Green Paper on the insurance of natural and man-made disasters. European Commission, Directorate General Internal Market and Services; Financial Institutions, 2014.

HM Treasury: Green paper on the Insurance of National and Man-Made disasters. Letter to the Internal Market & Services Directorate General, European Commission, on 30th July 2013., 2013.

Kontochristou, M. and Mascha, E.: The Euro Crisis and the Question of Solidarity in the European Union: Disclosures and Manifestations in the European Press, *Rev. Eur. Stud.*, 6(2), 50–62, doi:10.5539/res.v6n2p50, 2014.

Lane, P. R.: The European Sovereign Debt Crisis, *J. Econ. Perspect.*, 26(3), 49–68 [online] Available from: <http://www.aeaweb.org/jep/>, 2012.

NL: Response of The Netherlands to EC Green Paper on the insurance of natural and manmade disasters, 2013.

UNISDR: 2009 UNISDR Terminology on Disaster Risk Reduction, United Nations International Strategy for Disaster Risk Reduction, Geneva, Switzerland, May 2009., 2009.