Driving sustainability transitions through financial tipping points

Nadia Ameli, Hugues Chenet, Max Falkenberg, Sumit Kothari, Jamie Rickman, and Francesco Lamperti

https://doi.org/10.5194/egusphere-2023-1750

Reply to reviewers – R1

Here we provide our point-to-point replies to the comments raised by reviewer 1.
To better highlight the replies, we write them in italic dark blue. As we are not supposed to send over the revised manuscript at this stage, our replies are written using the future tense. Before moving to the replies, we take the occasion to thank the reviewer, Charlotte Gardes-Landolfini, for her constructive comments.

RC1: 'Comment on egusphere-2023-1750', Charlotte Gardes, 03 Oct 2023
Find attached my comments on this fantastic paper. I would be happy to discuss them with the authors, if needed,

All the best,

Charlotte Gardes-Landolfini (IMF)

Citation: https://doi.org/10.5194/egusphere-2023-1750-RC1

Charlotte Gardes-Landolfini
Climate change, energy, and financial stability expert – IMF CGardes@imf.org

Thank you for the authors for the opportunity to review this paper. My comments relate to **(i)** the framing of the paper and the climate impact of policy measures, and **(ii)** technical/secondary comments on some key concepts and/or initiatives laid out in the paper.

Framing and climate impact

o **The paper would benefit from greater critical thinking on the pass-through between financial sector policies (e.g., disclosure requirements, accounting requirements, prudential regulation (pillar I), etc.) and real economy decarbonization**. The risk of a mere redistribution of GHG emissions between financial market participants is real and explaining better to what extent any kind of financial sector policy (acting on return and/or risk) would have an impact on real-world decarbonization would be essential to the paper. Depending on the type of economy, industry, and financial market participant, as well as on the type of policy, these links

are not evident and would need to be substantiated (even from a theoretical standpoint).

We thank the reviewer for this comment, with which we completely align. We decided to amend the paper in two ways, to better discuss the issue pointed out by the reviewer. In the introduction of the paper, we will add a full paragraph to better emphasize the theoretical links we envision between financial sector policies and the decarbonization of the real economy, distinguishing between key sectors and financial actors. We agree the risk of a mere redistribution is real and that the manuscript can benefit from a more critical and detailed framing of the channels through which financial policies may affect emission mitigation. Indeed, we also will also modify the text at page 8 (where we discuss different financial policies and their expected effects on financial flows and emissions dynamics) to spell out the mechanisms at stake in more detail.

Finally, we believe some of our replies to the comments below could also help clarify the pass-through between financial policies and the decarbonization of real activities.

o **The paper would benefit from clarifying the application of tipping points from an alignment standpoint (i.e., financing the low-carbon transition) and a climate risk standpoint.** The type of tipping point (and associated policy (prudential and/or disclosure oriented, for instance)) may differ depending on the objective to be achieved. Yet, there may be some trade-offs between risk management and transition financing, that should be acknowledged, and could help refining the paper's conclusions on regulation.

Thanks for this remark. We had some issues at interpreting the exact point the reviewer is making on the "type" of tipping point. Indeed, in the text, we do not categorize nor taxonomize tipping points. However, we fully agree with the second part of the comment: trade-offs may well emerge between risk management and transition financing. Hence, we will amend the revised version of the paper to fully acknowledge and further discuss such an aspect. Specifically, we will amend section 2.1 and link the discussion on the trade-off to our treatment of sensitive intervention points. In addition, as suggested by the reviewer, we will revise the paragraph of our conclusions (pag. 9, lines 30-43) concerning regulation, and will better highlight the role of financial institutions and the consequences of using regulatory policy instruments (such as prudential requirements or disclosure obligations), emphasizing the trade-off.

o **Could the paper elaborate on the link between climate-related disclosures and repricing?** The paper appears to mix financial and extra-financial disclosures and/or accounting, and to make a direct connection between transparency and repricing of assets. Yet, for a variety of political economy, incentive-related, and operational reasons, this connection remains to be proven – despite increasing regulatory, policy and/or voluntary initiatives in this area. The focus on "informational policy" to drive change has been criticized by the literature and should not be overlooked.

This point is indeed crucial. The perceived shortcut is not intentional and needs to be adjusted. We will do so by clarifying what we intend to mean as the role of disclosure (pag. 5, first paragraph, lines 6-10) and insisting indeed that "transparency is not enough". Incidentally, there are also contributions by the authors that underline such aspects from an empirical and theoretical perspective. [Ameli, N. et al. (2019) 'Climate finance and disclosure for institutional investors: why transparency is not enough', Climatic Change. doi: https://doi.org/10.1007/s10584-019-02542-2.; Lamperti et al. (2021) Three financial policies to address climate risks, Journal of Financial Stability. Doi: https://doi.org/10.1016/j.jfs.2021.100875]

Technical/secondary comments

o **The concept of tipping points is used in an innovative manner in this paper and would benefit from clarification.** While this concept is usually contemplated from a climate science standpoint, its application to climate/sustainable finance policy is interesting. Yet, it would be important to connect it in this paper to the climate science domain and explain how similarly and/or differently it would need to be tackled from a policy perspective.

Thanks for this remark. Though the concept of "tipping point" is not novel in the economics and financial literature, a clear and shared definition is still difficult to find, especially given the increasing popularity of the concept. We will improve the clarity of the paper by discussing the concept of "tipping point" early in the text (starting from the Introduction) and connecting it to the literature on tipping points and threshold effects both in climate and social science. We will build on the general definition of tipping point by Lenton (2020): "Tipping points describe critical thresholds in complex systems that - if crossed - can lead to qualitatively" and the one of social tipping processes by Tabara et al. (2018) "'Social tipping processes' describe how social, political, economic or technological systems can move rapidly into a new system state or functioning". We highlight that both papers focus on the notion of "positive tipping point", which is close to that examined in this paper. [Lenton, T. M. (2020). Tipping positive change. Philosophical Transactions of the Royal Society B, 375(1794), 20190123.; Tàbara, J. D., Frantzeskaki, N., Hölscher, K., Pedde, S., Kok, K., Lamperti, F., ... & Berry, P. (2018). Positive tipping points in a rapidly warming world. Current Opinion in Environmental Sustainability, 31, 120-129.]

o **A synthesis of the main tipping points at stake, their transmission channels, and their potential impact, would be extremely relevant**. The paper is of a theoretical nature and lays out a key concept for future research and policy design. Yet, it may remain unclear for the reader to what extent these tipping points are linked (or not) to each other. A synthesis diagram would be relevant and could gain as much traction as the widespread climate risk/macroeconomy/financial system diagram that has been first designed by the NGFS, for instance.

Very good suggestion. We will endeavour to improve the paper with such graphical summary, linking together the different tipping elements we discuss in the text, including their potential influences. In particular, we will update section 2. wherein we elaborate on the potential for tipping points in the financial sector. However, we will also be very cautious in our discussion of such interactions. Differently than for other "tipping elements" in the coupled climate-economy system, where cascades of tipping points have been already proposed and evaluated, there is still scarce and unconsolidated evidence for positive tipping dynamics in the financial sector; actually, to the best of our knowledge, section 2.2 of the present paper is the most comprehensive attempt at collecting empirical and modelling evidence of such dynamics. Though a full treatment of the linkages between the tipping elements in the financial sector is beyond the scope of the paper, we fully agree that a more synthetic and better designed wrap up of the tipping points at stake would be extremely relevant.

o **Potentially relevant messaging could be extracted from the latest Chapter of the IMF Global Financial Stability Report (October 2023), on a) the policy mix to be achieved between carbon pricing and non-pricing/structural policies (including the climate information architecture) and b) the allocation of G-SIB lending to fossil fuel companies.** Greater detail may be found here: Global Financial Stability Report, October 2023 (imf.org).

This suggestion is appealing, and we thank the reviewer for pointing out the reference. We will update section 2.1 (pag.5), section 2.2 (pag. 8 and pag. 9) and the conclusions (pag. 9) to improve our discussion of the role of policy mixes in potentially inducing positive tipping points, balancing between "princing" and "non-pricing" policies. Further, we will also connect to the IEA (2021) Net-zero report, which also hints to the efficacy of policy combinations including both type of policy instruments. With respect to the role of G-SIB lending to fossil fuel companies, we will amend section 2.1 (pag. 5) and emphasize the potential for targeted policies at managing risks and inducing portfolio rebalancing dynamics, which indeed connects to our discussion of the sensitive intervention points identified by Farmer and colleagues (Farmer et al. 2019, Science; cited in the text) at lines 15-26.

o **The paper would benefit from:**

- \- A clarification of the low-carbon nature of the transition – currently defined as zero and

  negative emission assets. The focus on negative emissions may be controversial. The need

  to finance emission *reductions* in carbon-intensive assets may also be raised.

Thanks for this suggestion. In general, we believe our focus on negative emissions to be very mild. Negative emissions are only mentioned at line 2 of pag. 1 to stress the concept that reaching net zero with the current and envisioned set of technologies implies some removal of CO_2 from the atmosphere in additional to natural sinks. We do not think this is controversial, especially given the recent report of IPCC WGIII on

mitigation and the available set of 1.5 scenarios. Differently, we agree with the reviewer that the need to finance emission reduction in carbon-intensive assets should also be mentioned. We will amend the introduction (pag. 1) to better emphasize such an aspect.

- \- The reference to "carbon" emissions. While this is a commonly used terminology in academic

  papers, the term "greenhouse gas" should be preferred. Non-CO2 emissions are also

  extremely important (e.g., methane) and should not be overlooked in policy thinking.

Fully agreed. We will change the terminology employed in the text.

- \- The different nature of GFANZ (private-led, voluntary) and NGFS (central bank-led,

  voluntary) should be acknowledged. Both initiatives are very different from a political economy perspective, but also in terms of deliverables, ambition, members, and institutional dynamics. The paper could clarify what is meant by "NGFS opened a new governance framework to better coordinate and regulate the role of finance in addressing climate change".

Fully agreed. These two different frameworks need better articulation. Nevertheless, they also share common logics, in that both organisations' membership is voluntary and none are policy prescriptive. We will clarify this sentence, explaining that the NGFS was key and the first such initiative to instrumentally foster implicit coordination between financial (mostly delegated) authorities at global level, having in mind that their top-of-the-pyramid position in the financial system has great signalling and regulating power to infuse the whole panel of financial institutions worldwide.

- \- The difference between climate objectives (and what are they in the paper's framing?) and sustainability objectives. The paper uses both terms and concepts alternatively, despite their critical differences.

We will clarify this issue. The initial idea was to set the reflexion on climate change (both tipping and Paris objectives) and to expand it similarly to other tipping mechanisms and sustainability issues (starting with biodiversity / Kunming-Montreal objectives, which also use finance as an instrumental means of implementation). However, given the focus of the paper and the available space, we decided to stick to climate related objectives, which are translated in global warming's stabilization between 1.5 and 2 degrees, aligning to the Paris agreement goals. We will amend the introduction (and the rest of the text, where needed) to clarify the present aspect.