When enough countries lead by example, they create a tipping point for climate agreements

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Avoiding dangerous climate change is one of the most complex problems for international cooperation. It requires overcoming several barriers to collective action and success hinges on widespread cooperation by countries faced with incentives to delay costly mitigation and free-ride on the efforts of others.

The United Nations Framework Convention on Climate Change has warned that climate change may be “abrupt and catastrophic,” rather than gradual, once greenhouse gas concentrations in the atmosphere exceed a certain threshold (tipping point). This threshold is commonly identified as the concentration level that would translate to a 2°C average temperature increase above preindustrial levels. More recently, the Paris Agreement raised the ambition to limiting the increase to 1.5°C.

The scientific literature confirms the existence of dangerous thresholds, but it also shows that there is large uncertainty about their location. That is compounded by the political and technical uncertainty arising from translating such thresholds into the necessary mitigation measures to avert disaster, and further unpredictability about the economic value of the losses from failure to avoid dangerous climate change.

In addition, international climate negotiations that aim to reduce global greenhouse gas emissions are strongly influenced by inequality. The Kyoto Protocol addressed the North-South equity issue by recognizing the industrialised nations’ special responsibilities through the principle of ‘common but differentiated responsibilities’. However, major polluters and great powers, such as China and the U.S., have until recently proven reluctant to bind themselves to internationally agreed ambitious emission reductions.

While progress has been made in Paris, the move to a bottom-up architecture where states unilaterally announce their proposed targets confirms the burden-sharing difficulties. The main question is: *can countries implement an agreement that avoids the current stalemate and avoids catastrophic climate change*?

An optimistic interpretation is that enough action at various scales had accumulated in the years leading to the Paris

summit, such that even less committed countries acting in accordance to short-term self-interest raised their willingness to invest in climate change mitigation. Put differently, if enough actors (whether countries or subnational players) lead by taking example, the leaders' cumulative effort is potentially game-changing for the laggards. The rationale is that once a tipping point for sufficient investments in low carbon technologies has been reached, and constituencies with stakes in the nascent markets have formed, standard economic forces will sustain the transition to a carbon-neutral economy.

Tipping points thus play an essential role for the prospects of international environmental agreements such as the climate change negotiations. If countries perceive the benefits of avoiding the tipping point as higher than the costs, the possibility of a catastrophe transforms treaties into coordination devices. Hence, the problem becomes much easier to tackle than in the absence of a threshold for dangerous climate change.

Intuitively, this is so because the threshold provides an anchor for individuals to coordinate efforts upon. However, uncertainty on the location of the threshold as well as on the economic implication of abrupt change weaken the coordination anchor. This is bad news, since with sufficiently large uncertainty the game reverts back to a 'prisoner's dilemma', where free-riding incentives lock countries into inaction.

What else can we then rely upon, to design an effective treaty? Several mechanisms have been discussed that have the potential to mitigate the issues of shallowness of the mitigation efforts codified in environmental agreements and small stable coalition size, both of which translate into unambitious treaties and increase the threat of catastrophe. These range from expanding the strategy space through side payments and issue linkage, to introducing minimum participation rules, and imposing trade sanctions on non-participants.

The preferences of country representatives also matter. First, besides the generally assumed self-interest, negotiators may also be driven by other concerns. For instance, they may reciprocate based on the actions and perceived intentions of other countries' delegates.

Such preferences could also help explain the role of countries' expectations from one another on the success of treaties. In the presence of reciprocal preferences, countries with high expectations on the effort of others (i.e. for whom only high abatement is deemed fair) could have detrimental effects on international cooperation. Failure in the Copenhagen summit in 2009, owing to very high expectations in the run-up to the conference, and the leaders' efforts to moderate expectations before and during the Paris conference, are consistent with this view.

On the other hand, country representatives are also likely to take equity concerns into account when they decide how to share the burden. If countries have similar views on equitable burden sharing rules, such concerns could facilitate sustaining more ambitious treaties, since they curb the free-riding incentives and thus facilitate cooperation. However, countries often have different views on how to equitably split the cost, especially in the case of North-South negotiations.

Broadly speaking, taking these aspects into account may either ease or hinder the collective action problem. The question remains, however, about which aspects of the climate negotiations are more realistic. A recent literature has developed that aims at incorporating relevant factors that are likely to affect the outcome of treaties, such as reference dependence, and appetite for campaign contributions by policy makers subject to lobbying pressure. Furthermore, some improving mechanisms, such as imposing trade sanctions on those outside the 'climate club', while theoretically desirable may prove difficult to implement due to the threat of retaliations and potential escalation to trade wars. Equally important, we lack empirical evidence about the relative effectiveness of different schemes, or about the preferences of the negotiators.

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Notes:

- *This article is based on the authors' paper Tipping points and loss aversion in international environmental*

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- *The post gives the views of its author, not the position of LSE Business Review or the London School of Economics.*
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