Pledge-and-Review Bargaining

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Abstract

With pledge-and-review bargaining, as stipulated in the Paris climate agreement, each party submits an intended nationally determined contribution (INDC) before the set of pledges is reviewed and unanimously ratified. The procedure is repeated periodically, as newly developed technology makes earlier pledges obsolete. This paper analyzes a dynamic model of the pledge-and-review process and derives four main results: (1) If there is some uncertainty on the set of pledges that is acceptable, each equilibrium pledge is approximated by the asymmetric Nash Bargaining Solution, and the weights placed on the others' payoffs reflect the underlying uncertainty. Since the weights vary from pledge to pledge, the set of equilibrium pledges is inefficient. (2) Each party contributes too little to the public good, the incentive to develop new technology is weak, and the optimal period length is long. (3) This result is overturned when participation in the treaty is endogenous: The undemanding treaty motivates more countries to participate, and thus increases aggregate contributions, technology investments, and welfare, and reduces the optimal period length. (4) With heterogeneity, technology leaders (laggards) prefer broad-and-shallow to narrow-and-deep agreement too soon (late), relative to what is efficient. The analysis sheds light on crucial differences between the climate agreements signed in Kyoto (1997) and Paris (2015) and rationalizes the development from the former to the latter.

Key words: Dynamic games, bargaining games, foundation for the Nash Bargaining Solution, climate change, the Paris Agreement, technology