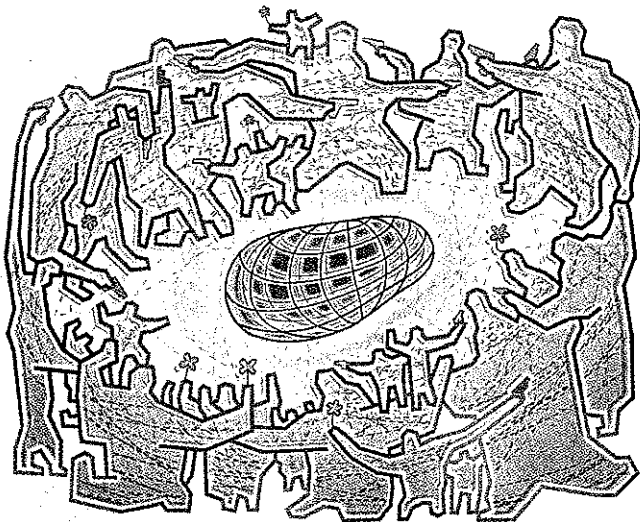


## Economics focus | Playing games with the planet

A version of the "prisoner's dilemma" may suggest ways to break through the Kyoto impasse



AT ANY given summit on climate change, it is never long before some politician declares how "urgent" or "vital" or "imperative" it is to stop the planet from overheating. And yet few governments are willing to tackle the problem by themselves. In practice, what these impassioned speakers usually mean is that it is urgent—no, vital!—no, imperative!—for all countries but their own to get to grips with climate change.

That is natural enough. After all, all countries will enjoy the benefits of a stable climate whether they have helped to bring it about or not. So a government that can persuade others to cut their greenhouse-gas emissions without doing so itself gets the best of both worlds: it avoids all the expense and self-denial involved, and yet still escapes catastrophe. The most obvious free-riders of this sort are America and Australia, the only rich countries that refuse to put a limit on their emissions. But they are far from being the only offenders: most poor countries, too, are keen to palm the responsibility for curbing global warming off on rich ones, and to continue to grow and pollute as much as they like.

The problem, of course, is that if everyone is counting on others to act, no one will, and the consequences could be much worse than if everyone had simply done their bit to begin with. Game theorists call a simplified version of this scenario the "prisoner's dilemma". In it, two prisoners accused of the same crime find themselves in separate cells, unable to communicate. Their jailers try to persuade them to implicate one another. If neither goes along with the guards, they will both receive a sentence of just one year. If one accepts the deal and the other keeps quiet, then the turncoat goes free while the patsy gets ten years. And if they both denounce one another, they both get five years.

If the first prisoner is planning to keep quiet, then the second has an incentive to denounce him, and so get off scot-free rather than spend a year in prison. If the first prisoner were planning to betray the second, then the second would still be better off pointing the finger, and so receive a five-year sentence instead of a ten-year one. In other words, a rational, self-interested person would always betray his fellow prisoner. Yet that leaves them both mouldering in jail for five years, when they could have cut their sentences to a year if they had both kept quiet.

Pessimistic souls assume that the international response to

climate change will go the way of the prisoner's dilemma. Rational leaders will always neglect the problem, on the grounds that others will either solve it, allowing their country to become a free-rider, or let it fester, making it a doomed cause anyway. So the world is condemned to a slow roasting, even though global warming could be averted if everyone co-operated.

Yet in a recent paper, Michael Liebreich, of New Energy Finance, a research firm, draws on game theory to reach the opposite conclusion. The dynamics of the prisoner's dilemma, he points out, change dramatically if participants know that they will be playing the game more than once. In that case, they have an incentive to co-operate, in order to avoid being punished for their misconduct by their opponent in subsequent rounds.

The paper cites a study on the subject by an American academic, Robert Axelrod, which argues that the most successful strategy when the game is repeated has three elements: first, players should start out by co-operating; second, they should deter betrayals by punishing the transgressor in the next round; and third, they should not bear grudges but instead should start co-operating with treacherous players again after meting out the appropriate punishment. The result of this strategy can be sustained co-operation rather than a cycle of recrimination.

Mr Liebreich believes that all this holds lessons for the world's climate negotiators. Treaties on climate change, after all, are not one-offs. Indeed, the United Nations is even now trying to get its members to negotiate a successor to its existing treaty, the Kyoto Protocol, which expires in 2012. Many fear that the effort will collapse unless the laggards can be persuaded to join in. But the paper argues that rational countries will not be deterred by free-riders. They will continue to curb their emissions, while devising sanctions for those who do not.

### Under lock and Kyoto

The Kyoto Protocol already embodies some of these elements. Countries that do not meet their commitments, for example, are supposed to be punished with a requirement to cut their emissions more sharply the next time around. But Mr Liebreich argues that there should also be sanctions for rich countries that refuse to participate, and stronger incentives for poor countries (which are exempted from any mandatory cuts) to join in. Rather than trying to craft an agreement that is agreeable to all, the more enthusiastic countries should simply press on with a system to which recalcitrant ones could later accede.

The global regime on climate change, Mr Liebreich believes, should also be revised more frequently, to allow the game to play itself out more quickly. So instead of stipulating big reductions in emissions, to be implemented over five years, as in Kyoto, negotiators might consider adopting annual targets. That way, co-operative governments know that they cannot be taken advantage of for long, whereas free-riders can be punished and penitents brought back into the fold more quickly.

There are flaws in the analogy, of course. In the real world, governments can communicate and form alliances, which makes the dynamics of the game much more complicated. And governments may not act consistently or rationally. Most observers, for example, assume that America's policy on global warming will change in 2008, along with its president. And most countries' willingness to act is presumably linked to the severity of global warming's ill effects. If things get bad enough, then with any luck everyone will play the game. ■

**2. CONVENTION ON THE ELIMINATION OF ALL FORMS OF DISCRIMINATION  
AGAINST WOMEN. NEW YORK, 18 DECEMBER 1979**<sup>2</sup>

<sup>2</sup> *Relevant provisions:*

**Article 9 :**

1. States Parties shall grant women equal rights with men to acquire, change or retain their nationality. They shall ensure in particular that neither marriage to an alien nor change of nationality by the husband during marriage shall automatically change the nationality of the wife, render her stateless or force upon her the nationality of the husband.

2. States Parties shall grant women equal rights with men with respect to the nationality of their children.

**Article 15 :**

1. States Parties shall accord to women equality with men before the law.

2. States Parties shall accord to women, in civil matters, a legal capacity identical to that of men and the same opportunities to exercise that capacity. In particular, they shall give women equal rights to conclude contracts and to administer property and shall treat them equally in all stages of procedure in courts and tribunals.

3. States Parties agree that all contracts and all other private instruments of any kind with a legal effect which is directed at restricting the legal capacity of women shall be deemed null and void.

4. States Parties shall accord to men and women the same rights with regard to the law relating to the movement of persons and the freedom to choose their residence and domicile.

**Article 16 :**

1. States Parties shall take all appropriate measures to eliminate discrimination against women in all matters relating to marriage and family relations and in particular shall ensure, on a basis of equality of men and women:

(a) The same right to enter into marriage;

(b) The same right freely to choose a spouse and to enter into marriage only with their free and full consent;

(c) The same rights and responsibilities during marriage and at its dissolution;

(d) The same rights and responsibilities as parents, irrespective of their marital status, in matters relating to their children; in all cases the interests of the children shall be paramount;

(e) The same rights to decide freely and responsibly on the number and spacing of their children and to have access to the information, education and means to enable them to exercise these rights;

(f) The same rights and responsibilities with regard to guardianship, wardship, trusteeship and adoption of children, or similar institutions where these concepts exist in national legislation; in all cases the interests of the children shall be paramount;

(g) The same personal rights as husband and wife, including the right to choose a family name, a profession and an occupation;

(h) The same rights for both spouses in respect of the ownership, acquisition, management, administration, enjoyment and disposition of property, whether free of charge or for a valuable consideration.

2. The betrothal and the marriage of a child shall have no legal effect, and all necessary action, including legislation, shall be taken to specify a minimum age for marriage and to make the registration of marriages in an official registry compulsory.

**Article 29 :**

1. Any dispute between two or more States Parties concerning the interpretation or application of the present Convention which is not settled by negotiation shall, at the request of one of them, be submitted to arbitration. If within six months from the date of the request for arbitration the parties are unable to agree on the organization of the arbitration, any one of those parties may refer the dispute to the International Court of Justice by request in conformity with the Statute of the Court.

2. Each State Party may at the time of signature or ratification of the present Convention or accession thereto declare that it does not consider itself bound by paragraph 1 of this article. The other States Parties shall not be bound by that paragraph with respect to any State Party which has made such a reservation.

3. Any State Party which has made a reservation in accordance with paragraph 2 of this article may at any time withdraw that reservation by notification to the Secretary-General of the United Nations.

**BRUNEI DARUSSALAM, 24 May 2006, 16 June 2006, 15 June 2007**

Reservations:

"The Government of Brunei Darussalam expresses its reservations regarding those provisions of the said Convention that may be contrary to the Constitution of Brunei Darussalam and to the beliefs and principles of Islam, the official religion of Brunei Darussalam and, without prejudice to the generality of the said reservations, expresses its reservations regarding paragraph 2 of Article 9 and paragraph 1 of Article 29 of the Convention."

**OMAN, 7 February 2006, 1 March 2006, 28 February 2007**

Reservations:

1. All provisions of the Convention not in accordance with the provisions of the Islamic sharia and legislation in force in the Sultanate of Oman;
2. Article 9, paragraph 2, which provides that States Parties shall grant women equal rights with men with respect to the nationality of their children;
3. Article 15, paragraph 4, which provides that States Parties shall accord to men and women the same rights with regard to the law relating to the movement of persons and the freedom to choose their residence and domicile;
4. Article 16, regarding the equality of men and women, and in particular subparagraphs (a), (c), and (f) (regarding adoption).
5. The Sultanate is not bound by article 29, paragraph 1, regarding arbitration and the referral to the International Court of Justice of any dispute between two or more States which is not settled by negotiation.

# LEGGI ED ALTRI ATTI NORMATIVI

LEGGI 2 agosto 2007, n. 134.

**Ratifica ed esecuzione dell'Accordo di coproduzione audiovisiva tra il Governo della Repubblica italiana ed il Governo della Repubblica dell'India, fatto a Roma il 13 maggio 2005.**

La Camera dei deputati ed il Senato della Repubblica hanno approvato;

IL PRESIDENTE DELLA REPUBBLICA

PROMULGA

la seguente legge:

Art. 1.

*Autorizzazione alla ratifica*

1. Il Presidente della Repubblica è autorizzato a ratificare l'Accordo di coproduzione audiovisiva tra il Governo della Repubblica italiana ed il Governo della Repubblica dell'India, fatto a Roma il 13 maggio 2005.

Art. 2.

*Ordine di esecuzione*

1. Piena ed intera esecuzione è data all'Accordo di cui all'articolo 1, a decorrere dalla data della sua entrata in vigore, in conformità a quanto disposto dall'articolo 18 dell'Accordo stesso.

Art. 3.

*Copertura finanziaria*

1. Per l'attuazione della presente legge è autorizzata la spesa di euro 23.950 da sostenere ogni quattro anni a decorrere dall'anno 2008. Al relativo onere si provvede, per l'anno 2008, mediante corrispondente utilizzo della proiezione per lo stesso anno dello stanziamento iscritto, ai fini del bilancio triennale 2007-2009, nell'ambito dell'unità previsionale di base di parte corrente «Fondo speciale» dello stato di previsione del Ministero dell'economia e delle finanze per l'anno 2007, allo scopo parzialmente utilizzando l'accantonamento relativo al Ministero degli affari esteri.

2. Il Ministro dell'economia e delle finanze è autorizzato ad apportare, con propri decreti, le occorrenti variazioni di bilancio.

Art. 4.

*Entrata in vigore*

1. La presente legge entra in vigore il giorno successivo a quello della sua pubblicazione nella *Gazzetta Ufficiale*.

La presente legge, munita del sigillo dello Stato, sarà inserita nella Raccolta ufficiale degli atti normativi della Repubblica italiana. È fatto obbligo a chiunque spetti di osservarla e di farla osservare come legge dello Stato.

Data a Roma, addì 2 agosto 2007

NAPOLITANO

PRODI, *Presidente del Consiglio dei Ministri*

D'ALEMA, *Ministro degli affari esteri*

Visto, il Guardasigilli: MASTELLA

**ACCORDO DI COPRODUZIONE AUDIOVISIVA  
TRA IL GOVERNO DELLA REPUBBLICA ITALIANA  
E LA REPUBBLICA DELL'INDIA**

IL GOVERNO DELLA REPUBBLICA ITALIANA E IL GOVERNO DELLA REPUBBLICA DELL'INDIA, di seguito denominati le "Parti",

CONSIDERATO che è auspicabile stabilire una rete di disposizioni per lo sviluppo delle loro relazioni in campo audiovisivo e in particolare nelle coproduzioni cinematografiche, televisive e video;

CONSAPEVOLI che la qualità delle coproduzioni può contribuire ad una ulteriore espansione delle industrie di produzione e distribuzione cinematografica, televisiva e video di entrambi i Paesi così come allo sviluppo dei loro scambi culturali ed economici;

CERTI che tali scambi contribuiranno al rafforzamento delle relazioni tra i due Paesi;

HANNO CONVENUTO QUANTO SEGUE:

ARTICOLO 1

In questo Accordo, a meno che lo stesso preveda diversamente:

- (i) Si intende per "coproduzione" un progetto di film, inclusi lungometraggi, documentari, film a carattere scientifico, film di animazione e pubblicitari, di qualsiasi durata, sia su pellicola, videocassetta o videodisco, che potrà essere utilizzato nelle sale, in televisione o su videoregistratori, prodotto da produttori dei due Paesi con un investimento comune e realizzato nel rispetto delle condizioni di riconoscimento, stabilite dalle competenti Autorità Indiane e italiane, ai sensi del presente Accordo. Nuove forme di produzione e distribuzione audiovisiva saranno incluse nel presente Accordo attraverso uno scambio di note tra le Parti.
- (ii) I progetti di coproduzione da realizzarsi ai sensi del presente Accordo dovranno essere autorizzati dalle seguenti Autorità, di seguito denominate le "competenti Autorità":
  - a) in Italia, dal Ministero per i Beni e le Attività Culturali, Dipartimento per lo Spettacolo e lo Sport, Direzione Generale per il Cinema;