Game Theory and Climate Change

Game theory is an attempt to display strategic situations in which the success or outcome for an individual, group or a nation depends and varies according to the choices made by others. It is a process by which groups attempt to achieve a maximum outcome or profit either for themselves or others which they receive as a result of their decisions in the long run.

Game theory in its most basic understanding is viewed in terms of the 'Prisoner's Dilemma'. This assesses the decisions and outcomes of two prisoners where they can either choose to stay silent or defect. The figure shows that the minimum time in jail is nothing, whereas the maximum is a year. In this application of game theory it is a single decision made separate from the other prisoner. This means that each decision is made independently and although the two people might know each other, they have no experience in the decision the other might come to. The optimum outcome for the both of them is where they both stay silent, only serving a month. However if just one defects, one prisoner goes free whereas the other spends a year in prison. Or the final outcome is where they both defect and therefore both serve 3 months jail time.

	Prisoner B stays silent (*cooperates*)	**Prisoner B confesses (*defects*)**
Prisoner A stays silent (*cooperates*)	Each serves 1 month	Prisoner A: 1 year Prisoner B: goes free
Prisoner A confesses (*defects*)	Prisoner A: goes free Prisoner B: 1 year	Each serves 3 months

Game theory is an extremely interesting and useful part of economics as it is so relevant to various applications in the everyday world, one being climate change. Climate change is seen as a global threat and has been increasingly acknowledged across the globe as the risks of it altering and harming the world also increases. On a basic level climate change is caused by greenhouse gases. Greenhouses gases include carbon dioxide, carbon monoxide and nitrogen oxide which trap the suns radiation within the atmosphere of the earth. There are several ways in which an increase in greenhouse gases is brought about by humans: CO2 emissions through burning fuel for cars and planes, deforestation leading to a smaller uptake of CO2 and also then the burning of the trees causing a rise in the amount of CO2. This then causes temperatures to rise, causing climate change.