Global response to the financial crisis
Game Theory

William
In the discussions so far we have seen that thinking about collective action problems and what kind of collective action problems we face might be useful, but one of the difficulties students often come up with in thinking about using game theory are things like 'how do we know which games are in play?', 'which games to use?', 'how do we know what pay offs actually are in the real world?' Can we just talk about this a bit more? Hedley do you want to start us off?

Hedley
Yes as Simon has indicated we need to be very careful in trying to force as it were particular real world situations into particular models such as the prisoner's dilemma. What we doing really is we are looking at um various problems and we are considering various game structures which can be useful in analysis and we are looking for features of those real world situations which seem to make them appropriate for analysis in terms of particular games. But we don't want to see this as something which is hard and fast, we don't want to say oh this is a prisoner's dilemma type problem, this is an assurance game problem, we really need to look at the features of what it is that we are trying to understand um and then start asking well you know is there a sort of a game theory structure that would help us in analyzing this? As regards the pay offs, er the numbers that we put in matrices of course have no er real significance er what we are really doing is ranking preferences of the players when we construct a game theory matrix and the numbers are there very much as er as kind of indicators to help us to rank those preferences. I know students are often quite bothered about well where did 150 come from, or where does 60 come from and what we are really doing in game theory is talking about preferred outcomes and equilibria and the numbers themselves are just illustrative.

William
So what matters is that is that you can identify that a player would prefer this outcome to that outcome?

Hedley
Absolutely.

William
Simon do you want to come in on this?

Simon
Yes I think so – one of the things we should say about pay offs is not just the point that Hedley has just made that in a sense the numbers themselves in any absolute sense are not important, it's the ranking that's important, so actually one could have used letters and then just said A is greater than B, B is greater than C and so on, so for preferred choices. But the other point is that the actors concerned that we are proposing to model through these various games, don't need to be able to put numbers on the pay offs themselves and they don't even need certainly about the pay offs, – what is needed for this to be a helpful representation is that actors act as if they do have preferences and in many cases they do as we have seen from the – for example G20 communiqué, they do state preferences and quite often one can see from as it were the actual actions that people undertake, what their preferred course of action was or is. So as long as we have got enough information in that sense to say well a state could choose to regulate private financial institutions in a particular way in its territory or not, or it could choose to cooperate in an international body to write new rules about capital adequacy ratios for banks or not and so on. As long as we can go to that level and make some ranking of the choices that the private institutions or states are making, that gives us

enough at least to start game theoretic type reasoning, it doesn't necessarily tell us what the game is. So I think the most important thing for students to get out of this is not so much that you will necessarily be able to map particular games onto particular context, that we are confronted with particularly one as complex as the kinds of things we have been discussing, but its still helpful to think through some of these things in game theoretic terms because it is a very good way of allowing us to think through issues of interdependence and allowing us to think through issues of divergence of if you like, individual and collective rationality that what makes sense for any one player may not make sense for that player taken in the context of other players– making independent decisions, but where their actions are interdependent.

William
And Grahame you'd questioned the use of game theory partly in relation to that idea of rationality?

Grahame
I think game theory is very good in kind of calm times really and it seems to me that some of the sort of the – the issues that Simon was just raising there are at least questionable amongst kind of financial agents, when things hot up if I might put it like that, when enthusiasms, passions and emotions take over and where they don't quite know where their preferences are. I think – it is – is it worth just recognition that it may not – that preferences and sort of you know moving into a equilibrium may not quite be kind of how the thing goes because it – it gets overwhelmed by behavioural enthusiasms and passions and emotions. You know you get band wagoning, people jumping on the band wagon, everybody doing exactly the same as somebody else merely for the fact that somebody else is doing it, you get bubbles developing so that the whole system blows up and so on and people want to keep their own um action going in that context. What is called animal spirits, what John Maynard Keynes called animal spirits, sort of not thought out but immediate reactions and er quick un thought out actions. Those kinds of things I think if the financial system exposes those as part of the way the economy works I think in a rather acute manner, and therefore if – if – if this is the case, then a kind of top down sort of calculative mechanisms brought in to try and help the regulation by as I was saying the BIS, the Bank of International Settlements, the IMF or the G20, might not actually work. I think it is just worth thinking that there may be – to get a collective action there may be another way of doing it, not having a top down, having very much a bottom up, looking to what has actually happened with respect to the different particular financial systems, what regulatory mechanisms they have installed and trying to build up from the bottom rather than you know setting up a global system– rules which everybody has to meet. So I think there is an alternative way of thinking about the regulatory system, thinking of it very much like natural disasters a little bit that its inevitable it will happen, we don't know quite when and where, but we know that it is going to happen again, what do you do if you are into that mind set, can you network the vulnerabilities in the system from below rather than trying to establish a sort of common set of rules from above and I think there is another way of thinking about how we might respond to a crisis like this.

William
So that would imply that at least in addition to thinking about the collective action problems amongst states in regulation, we also need to think about what are the opportunities for cooperation among other agents at a kind of lower level?

Grahame
You know I think that we need both rationality and top down regulatory but also very much bottom up sort of forms of regulation as well in the manner, so I don't think they are exclusive, but I think the – the minimal amount of collective action that – that Simon was describing and Hedley also that the G20 has come on with is – is appropriate but one suspects that won't be enough to stop these cycles coming on again and one probably needs to address it you know a bottom up approach at the same time.

William
That would suggest a limited usefulness of game theoretic analysis?

Simon

Yes I think so, I think its - its an empirical question really isn't it, it's a question about in what circumstances are the available strategies to various actors so uncertain and the ability of actors to rank their pay offs so indeterminate that it ceases to be helpful to talk about games, than being involved in playing games or modeling them you know in game theoretic terms and clearly there are circumstances where that happens where you simply can't describe a kind of a reasonably limited array of strategies open to an actor, you can't identify with any degree of even guess work what the potential pay offs are on different courses of action.

William
Because the situation is so fluid?

Simon
So fluid, so fast changing, so uncertain in Grahame's sense you know that because some of the behaviour involved is – is so irrational or a rational, ah motivated in kind of other ways that are not really amenable to those kinds of broadly speaking calculative kinds of reasoning. Clearly in those circumstances its not helpful to think in game theory terms, it seems to me it must be the case that – that is sometimes the case I'd suppose its really then a kind of empirical question as to kind of how uncertain and how fast changing and how messy does the world need to get before one says these are no longer useful ways of thinking about it.

Grahame
I agree with Simon you know that this doesn't rule out the efficacy and the usefulness of game theory as a way of kind, as a first stage of thinking about these things, it sets up a very logical framework in which one can isolate out what the strategies are likely to be and what the kind of interactions between the players are, there is an absolutely key kind of first move and it works certainly in calm times and its worth absolutely doing. There is this other sort of element which you have kind of mentioned which I think can disrupt this at times, but – but in general it's a it's a most attractive and effective framework for thinking about the – the ways in which interaction around cooperation can develop.