The assumptions of rational choice theory may be wrong but they can still provide a useful foundation for analysis.

Rational Choice Theory

Benevolence vs. Deterrent Strategies

The assumptions of rational choice theory may be wrong but they can still provide a useful foundation for analysis?

Introduction

This paper begins with a brief history of rational choice theory and rational choice theory modelling. Subsequently rational choice theory's position in the contemporary world is explained with a very brief description of the latest developmental attempts of societal computational modelling is discussed. The section entitled "What is all the fuss about" extends this discussion with an explanation of the creation and importance of rational choice theory models, and, firmly places the roots of contemporary rational choice theories within game theoretical theory and the cold war.

"Practical rational choice" begins with the Hypothesis that terrorism can be priced out of the market. A rational choice model of terrorism that attempts to model alternative ways of deterring terrorist activities through the use of benevolent strategies as opposed to deterrent strategies is analysed and discussed. A brief description of the mathematical approach is touched

Rational Choice Theory
The assumptions of rational choice theory may be wrong but they can still provide a useful foundation for analysis.

upon starting with the importance of the Slutsky equation for measuring the 'cross price elasticity of terrorism' (Anderton and Carter, 2005; pp 279-280). However, it is the epistemological that is explained and of relevance. The use and significance of rational choice theory modelling and the assumptions they make is discussed in the final sections and in conclusion sums up the merits and failures of rational choice models and rational choice theory.

Brief history of rational choice modelling to date

Rational choice theory has a long history. It can be traced back through Adam Smith who based his free market liberal economic theories on principles of rationality and reason. Interestingly both Adam Smith and Karl Marx borrowed from Hegel's, (1807) seminal work on "Rationality and Reasoning: The Phenomenology of mind" yet they could not have drawn more different conclusion from the same piece of work.

Since the 1950 rational choice theory modelling has had an ever growing presence in the international political arena, being the dominate principle behind cold war planning and negotiations. During the next few decades rational choice theory gained an even higher prominence, eventually becoming the mainstream economic theory during the Thatcher and Reagan years in the late 1970s and early 1980s. In the modern world rational choice theory has become the dominant underlying principle behind liberal economic and political policy and the driving force behind contemporary international relations (Hampsher-Monk and Hindmoor, 2010).

Most recently Gareth Morgan (BBC, 27th /Dec/ 2010: http://www.bbc.co.uk/news/technology-12012082), reported that 'An international group of scientists are aiming to create a simulator

Rational Choice Theory
The assumptions of rational choice theory may be wrong but they can still provide a useful
foundation for analysis.

that can replicate everything happening on Earth', from global weather patterns, the spread of

diseases or the workings of international financial transactions to the 'congestion on Milton

Keynes roads' (2010). The project headed by Dr Helbing 'Nicknamed the Living Earth

Simulator' (ibid) is going to be the largest joint scientific project that has ever taken place,

dwarfing that of the new Large Hadron Collider. 'What is needed is a knowledge accelerator, to

collide different branches of knowledge', says Dr Helbieng 'Revealing the hidden laws and

processes underlying societies constitutes the most pressing scientific grand challenge of our

century... Over the past years, it has for example become obvious that we need better indicators

than the gross national product to judge societal development and well-being'…, Dr Hellbieng

argues (ibid). This highlights the extent of rational computational modeling to date.

So what is all the fuss about?

   Rational choice theory, akin to game theoretical theory, uses mathematical predictive

modelling and utilises the Nash equilibrium in attempt to model society and the political process.

Rational choice theory modelling (RCTM) was a positivist response to threat posed by the

Russians during the cold war. It was intended as a tool to be used in order to gauge the level of

threat posed at any given time so as to outguess the enemy and to ensure mutually assured

destruction in the event of a nuclear attack. Game theoretical theory particularly the earlier work

by John von Neumann (1928) and Newman & Oskar Morgenstern (1944), which was later

refined by John Nash (1950); a certified paranoid schizophrenic, with the 'Nash equilibrium

model', for which he received the noble prize, became the dominant model for achieving this

aim (Hampsher-Monk, 2010) .

Rational Choice Theory
The assumptions of rational choice theory may be wrong but they can still provide a useful foundation for analysis.

Underlying rational or public choice theories is positivism: the attempt to use the methods of physical sciences and trying to transpose them to the study of politics, society and economic behaviour. The hope was to produce mathematical models able to explain and predict phenomena. 'Public choice writers strongly believe they are studying political phenomena in much the same way that natural scientists study physical phenomena. Their methodology is positivist, trying to formulate universal laws or hypotheses which can be verified or falsified by empirical testing' (Dunleavy and O'Leary, 1987; p 87).

The Nash equilibrium is best explained through the prisoners dilemma theory; if we don't they will, so we had better do it first, which is a theory of self interest as an overriding principle that governs all human action; this leaves no room for altruism charity or goodwill, despite this however, positivists would argue that'The formulation of the Nash equilibrium has had a fundamental and pervasive impact in economics and the social sciences which is comparable to that of the discovery of DNA' (Myerson 1999; pp 1-2.) To put it simply, rational choice theory is the modelling of political behaviour on the simplifying assumption that political actors are instrumental, 'self-serving utility-maximizers' (Hay, 2004; p 41: Dunleavy, 1987; pp 87-88).

The rational choice model described in this paper, presented in simplified form, is not dissimilar to those used by governments, social scientists, economists and military war gamers in the real world. Rational mathematics is based on the principle of mathematical logic and utilises the Nash equilibrium. These models underpin our economic and strategic world. Yet even in there simplest format they prove to be questionable.

Practical Rationality: How to stop Terrorism

Rational Choice Theory

The assumptions of rational choice theory may be wrong but they can still provide a useful foundation for analysis.

Benevolence vs. Deterrent Strategies

Hypothesis

In response to the Hypothesis made by Frey and Luechinger (2003) who contrast the potential benefits of 'benevolence' versus 'deterrence' strategies to discourage terrorists from aggressive activities, Anderton and Carter (2005) (attempt to model and test this hypothesis by the following route:

The commodity terrorism is weighed against all other activities. Then they substitute other activities with composite goods. By lowering the prices of composite goods this should have the effect of increasing the price of committing acts of terror? The result should be, the demand for terrorism will drop, as it becomes too costly an activity to undertake. Doing any other activity would be cheaper and hold more opportunity in comparison to committing acts of terror, therefore more worthwhile; the rational choice. The intention is to price terrorism out of the market (Anderton et al. 2005).

Benevolent strategies

It could be said that benevolent strategies are the antitheses of deterrent strategies, in that they are benign non violent strategies that attempt to create a better society in order to lower crime, in this case terrorism. There are many way in which this can be achieved such as, freeing up religious space and improving the general quality of life by offering public services, health care, and opening or freeing up markets. Thus by improving opportunities and the economy and

by lowering the prices of essential commodities like food and clothes etc, it should cause destructive behaviour to decrease.

The list of benevolent strategies is endless; all of the above could be considered benevolent actions. 'A benevolence strategy also raises the opportunity cost of terrorist violence, but it does so by reducing the cost of non-violent activity, or what Frey and Luechinger (2003) call "ordinary activity" '(Anderton & Carter, 2005; p 1) However, the general idea is to make life more pleasant and fruitful or at least appear so in order to drive up the opportunity costs for employing terrorists and committing acts of terrorism (Anderton& Carter, 2005).

Deterrent strategies

Deterrent strategies are zero sum gain activities, being essentially belligerent they supposedly raise the cost of terrorism by defending potential targets, such as, military installations, government building and historic sites to name but a few. This raises the opportunity cost of terrorist activities through militarised protectionist activities (Anderton, 2005: Frey and Luechinger 2004: et al) Deterrent strategies are the favoured strategies of authoritarian regimes and powerful "liberal" "military" (sic) States like North Korea, china and the USA respectively.

The Slutsky cross price elasticity of Terrorism

Because computational models are generally static in that they tend to produce yes no answers the best we can expect is yes, no or maybe as answer. Consequently they are not very good at picking up variations between multiple data sets. That is why the

Rational Choice Theory
The assumptions of rational choice theory may be wrong but they can still provide a useful foundation for analysis.

mathematicians/economists introduce external formula that can detect the variation or changes between one product and another. To do this the 'Slutsky equation, a central and well-known result in microeconomic theory' (Anderton & Carter. 2005: pp 279-280), is very helpful for this task. The Slutsky equation generates the demand and price curves that economist call the elasticity, the equation can be formally stated for the present case as:

'$\varepsilon\, TY = \sigma\, TY - \alpha Y \eta T$

Where σTY is the compensated cross price elasticity of terrorism αY is the budget share of the composite good, and ηT is the income elasticity of terrorism' (Anderton & Carter, 2005: p 279). The Slutsky equation breaks down the cross price elasticity into two parts called, 'respectively, the substitution and income effects' (ibid). All commodities including terrorism are considered net substitutes.

The Model

$$\varepsilon_{YY} = \sum_{i=2}^{n}\sum_{j=2}^{n} s_i \varepsilon_{ij} = s_2\left(\varepsilon_{22} + \varepsilon_{23} + \cdots + \varepsilon_{2n}\right) + \cdots + s_n\left(\varepsilon_{n2} + \varepsilon_{n3} + \cdots + \varepsilon_{nn}\right) \quad (1)$$

Figure 1 (Anderton & Carter)

Here is an example of a "simple" complex rational choice model (fig 1) in its pure form. In this instance the Slutsky formulae has been incorporated to measure the effect of composite goods (all other activities) against the commodity of terrorism. This is the way social scientists, politicians and economists attempt to find the parsimonious solution to a complex problem. That is to use Occam's razor to find the simplest most rationale explanation of a complex system by the simplest route.

Rational Choice Theory

The assumptions of rational choice theory may be wrong but they can still provide a useful foundation for analysis.

This paper is not going to attempt to interpret this model in the mathematical sense, rather it is here as an example of the mathematical complexity behind making decisions based on rational choice; this is the kind of maths that you need to use in order to test whether it was a correct choice, or not, or if you want to predict the best choices to make in the future. There are two ways to approach problems like this. One is the ontological approach that is to study the maths and what is going on there; or rather, the epistemological approach that is of interest to this paper; that is the suppositions that these models pose, how they arrive at these suppositions and how these postulations affect the real world.

What these models are trying to do is 'capture the dialectical relationship between the Ideational and the Material' (Hay, 2002: p 214). However, despite the mathematical complexity of these models the structure or framework for of these models is laid down by social scientists. An example of this can be seen in figure two.
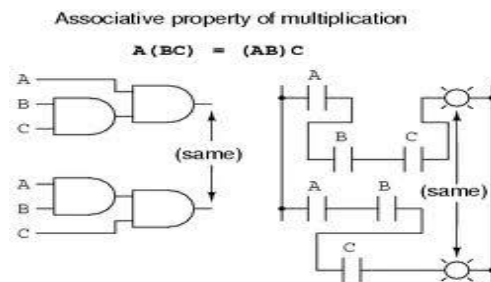

Figure 2

This is where the social scientists clarify the relationships and the stricture of the modelled. Therefore, the foundations may be solid and built on logical assumption only if the initial data sets are solid. Examples of these structural models can be found in Crane & Abla Amawi (1997: pp 214-218) and also in Colin Hay (2002: p 212) where they describe the theoretical construction

Rational Choice Theory
The assumptions of rational choice theory may be wrong but they can still provide a useful foundation for analysis.

and operations of rational choice models. However, it is like trying to account for the

unpredictable and the unimaginable.

Fortunately these models produce results that can be understood; in figure 3 it can be seen

that the hypothesis at least was correct [T1 standard deviations moves to T2 when benevolent

strategies are employed, Y1, 2, 3, equals all other activities .i.e. substituted with the commodity

indicated as composite goods]. By lowering the price of composite goods the cost of terrorism

rises comparatively and thanks to Slutsky we can see the demand goes down as the price rises

compared to composites; therefore the cost of hiring individual terrorists should concomitantly

rise, this will have the effect of lowering the quality and standard of workmanship (of terrorists)

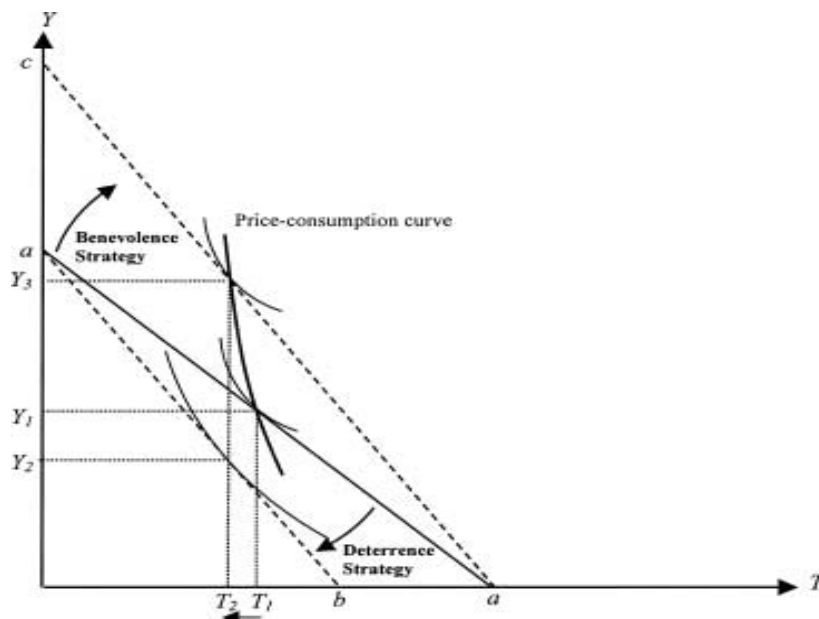and thus acts of terror should decrease. With elasticity, benevolence works (Anderton& Carter,

2005).

Figure 3 (Anderton & Carter, 2005)

Rational Choice Theory
The assumptions of rational choice theory may be wrong but they can still provide a useful
foundation for analysis.

Figure 4 extracts the working hypotheses and show that the results only work positively i.e.

reduces terrorist activity, where there is elasticity. An inelastic system shows that terrorism

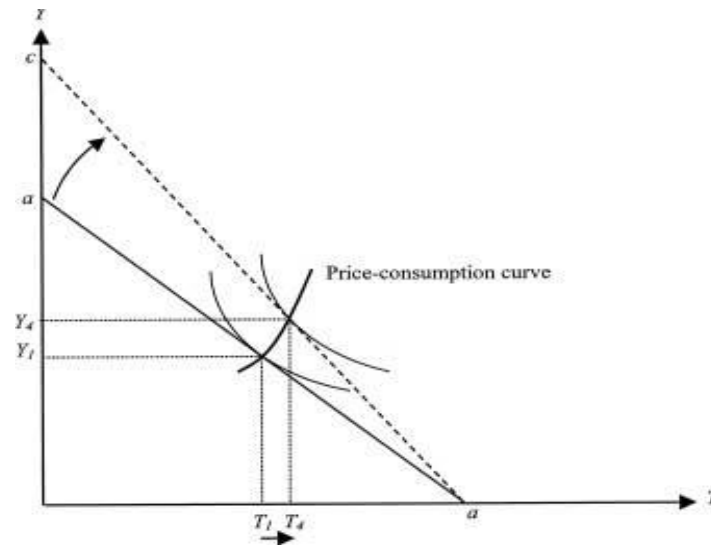would get cheaper therefore more likely to occur.

Figure 4 (Anderton & Carter, 2005)

So why is elasticity so important? Simply put societies that have elastic (flexible)

economies have a greater opportunity to prosper; rigid systems are not open for change or

growth, where as in a flexible systems change and growth can occur more easily due to the

variety and variations in opportunity costs.

What's wrong with models like this?

When it comes to modelling society it is simply the case that 'people are not like that'

(Marsh & Stoker, 2010; p 51). Dunleavy explains Hayek's criticisms of the positivism of

rational choice theory in two main areas. Firstly the subjectivity of assumptions in social

sciences is open to debate about their validity and is incompatible with empirical testing. 'Most

The assumptions of rational choice theory may be wrong but they can still provide a useful foundation for analysis.

of the 'facts' of the social scientists are subjective, open to contested interpretation, and not amenable to laboratory testing'… (Dunleavy, 1987; p 88). Secondly; simply put there are too many variables; there is difficulty in knowing the value of the variables and the degree of uncertainty and unpredictability in human behaviour. Societies are to complex and inundated with too many multiple determinants and thus concomitantly abound with too many uncertainties to establish the 'magnitude' or 'value' of these variables. 'The study of a market process, for example, requires knowledge of too many unknowable and un-measurable variables'... (Dunleavy, 1987; p 88). Consequently any attempt to construct an accurate predictive model for this societal phenomenon is limited and doubtful.

'To assume that analysts who prize parsimony do so because they presume (or presume to know) the world to be simple is to underestimate the complexity of the issues at stake'… (Hall, 2004; p 46). Positivists in general only concern themselves with what can be measured and more often than not ignore what cannot be quantified or measured (Dunleavy, 1987). However, they do this in order to make some sense of the complexity of society, by extracting, and applying meaning to, what can be measured.

Rational choice models leave no room for altruism, belief systems, cultural norms or emotions that govern our decision making process albeit unconsciously (see fig 5), they ignore that agents/humans instilled behavior is constituted in their individual lives.

Rational Choice Theory
The assumptions of rational choice theory may be wrong but they can still provide a useful foundation for analysis.
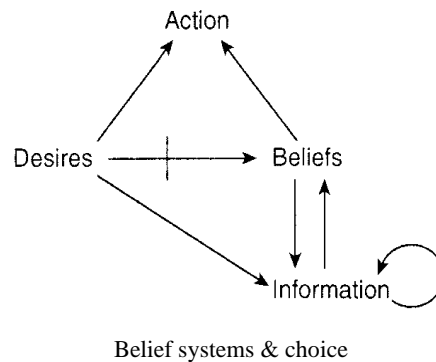

Belief systems & choice

Figure 5

Moreover, inherent in anti-terrorism policy is the conviction that terrorism is a normal commodity; reduced resources are expected to reduce terrorism. On the contrary if terrorism was a normal commodity, when the commodity starts to fail, and demand drops due to the increase in price, then the obvious strategy would be to provide 'cash grants to terrorists' (Anderton & Carter, 2005; p 280), in order to support the commodity through times of financial difficulty or to encourage terrorist to stay at home.

Deterrent strategies don't work they just cause more trouble. An ancient Chinese philosopher Lau Tzu (600Bc) once said that if you fight aggression with aggression you get more aggression and here we finally have the proof of that statement. It has taken us a long time to get here.

Societies that have no flexibility (income inelastic), in other words a rigid system with no opportunity and high composite costs can cause more terrorism. Lowering the price of composite goods in this situation could make matters worse for very obvious reasons.

Rational Choice Theory
The assumptions of rational choice theory may be wrong but they can still provide a useful foundation for analysis.

On a final note, this kind of model also assumes that terrorists (to finish the statements correctly) are 'utility maximisers of happiness' thus setting the presupposition that money equals happiness, and therefore terrorists would choose the most economically rational option towards that happiness. The choices that this model has to offer, between becoming a capitalist commodity utility maximisers or committing acts of terror; forgets that most modern day terrorists are looking for a transcendental reward rather than a material one that no earthly riches can substitute. For them that is a rational choice.

Conclusion

When it comes to predicting human nature there are so many variables that it becomes impossible to model. We have some predictable behavioural patterns in a set of conditions. However, in the real world people are just too unpredictable for many reasons.

Some of the assumptions of this model appear to be true. However, to test any theory that drops out of this model would be akin to running the model then poking a stick at reality to see if you get the same result**.** The ethics of this kind of research would be questionable. Yet our politicians, governments and financial institutions undertake all the time on our behalf, by use of benign modelling to assist with the implementation of policy into the public space or to second guess the stock market.

We can't even accurately model the flow of water through a pipe using the most advanced fluid dynamics. This reveals our limitations. Accordingly we are a long way of modelling human behaviour. Humans are just not predictably rational in the economical sense.

The assumptions of rational choice theory may be wrong but they can still provide a useful foundation for analysis.

However, there are still some interesting debates to be drawn from the results that are open for discussion, namely; societies that have access to cheap composite or essential goods and opportunity to proposer are generally more peaceful. This is a reasonable and good assumption that can be tested. We have only to look at the crimes rates in the wealthiest countries in the west that have a more even distribution of wealth like Switzerland or Sweden to see that this is true, at least in the west that is.

It is clear that this rational choice model raises more questions than it answers. Rational models not unlike this are at the heart of our "liberal" economic system despite their suspect predictive capabilities, even in their simplest form. The reason for this is the human element.

This suggests that rational choice as prognostic expounding theory needs to be readdressed. However, this is no reason to dispel rational choice completely. Rational choice should not to be used as 'a theory in its own right' (Hay, 2004: p 39), but only as 'a heuristic analytical strategy for exploring hypothetical scenarios' (ibid). In this respect they provide insight but not predictive capability.

The utility of any predictive model can be assessed by the extent to which it tell us things that are both true and novel. The essential point in this application of rational choice models is that the true things they tell us are largely not new and the new things they tell us are largely not true.

END

Bibliography

Rational Choice Theory
The assumptions of rational choice theory may be wrong but they can still provide a useful
foundation for analysis.

Anderton, Charles H & John R. Carter (2005) On Rational Choice Theory and the Study of

Terrorism, Defence and Peace Economics 16(4):275 - 282.

Dunleavy, Patrick and Brendan O'Leary.(1987) Theories of the state: the politics of liberal

democracy. Basingstoke: Macmillan Education.

Frey, Bruno S & Simon, Luechinger (2004) Decentralization as a disincentive for terror,

European Journal of Political Economy 20(2):509-515.

Hampsher-Monk, Iain and Andrew Hindmoor (2010) Rational Choice and Interpretive Evidence:

Caught between a Rock and a Hard Place? Political Studies 58(1):47-65.

Hay, Colin (2002) Political analysis: a critical introduction. Basingstoke: Palgrave.

Hay, Colin (2004) Theory, Stylized Heuristic or Self-Fulfilling Prophecy? The Status of

Rational Choice Theory in Public Administration,   Public Administration 82(1):39-62.

Marsh, David & Gerry Stoker (2010) Theory and methods in political science, 3rd Edition,

Basingstoke: Palgrave Macmillan.

Morgan, Gareth (2010) Technology reporter BBC News, Earth project aims to 'simulate

everything, http://www.bbc.co.uk/news/technology-12012082), (last accessed on

05/01/2011).

Myerson, Roger B (1999) Nash Equilibrium and the History of Economic Theory, Journal of

Economic Literature 37(3):1067-1082.

Cited works and other sources used for this paper

Frey, B.S. and Luechinge S (2003*)* How to fight terrorism: alternatives to deterrence. Defence

and Peace Economics 14(4) 237–249.

Rational Choice Theory
The assumptions of rational choice theory may be wrong but they can still provide a useful foundation for analysis.

Hayek, F. von (1979) The Counter-Revolution of Science (Indianapolis: Liberty Press), first published 1953.

Hegel, Georg Wilhelm Friedrich,(1931) The Phenomenology of Mind, Translated ... by J. B. Baillie ... Second edition, revised, etc. [With a portrait.]: pp. 814. G. Allen & Unwin: London; Macmillan Co: New York.

Nash, Jr. John F, (1950 a) The Bargaining Problem, Econometrica, 18, pp. 155-62.

Nash, Jr. John F (1950 b) Equilibrium Points in n-Person Games, Proceedings Nat. Academy Sciences USA, 36, pp. 48-49. . 1951. Noncooperative games, Annals Math, 54, pp 289-95.

Nash, Jr, John F (1953 c) Two-Person Cooperative Games, Econometrica, 21, pp. 128-40, (1996), Essays on Game Theory (Intro. By Ken Binmore) Cheltenham, UK: Edward Elgar.

Von Neumann, (John. 1928) "Zur Theories der Gesellschaftsspiele," Mathematische Annalen, 100, pp. 295-320. English translation by S. Bergmann, in R. D. Luce and A, W, Tucker, eds, Contributions to the Theory of Games IV (1959), pp. 13-42, Princeton U. Press. (1953) Communication on the Borel Notes, Econometrica, 21, pp. 124-25.