*Strategic Management*, 9e: Chapter 5 study guide

Strategy dynamics using game theory

The game-theory route refers to structured methods of bargaining with and between customers, suppliers and competitors of the organisation, such structuring involving the quantification of possible outcomes at each stage of the strategy decision-making process.

For example, the free web case linked to this text describes how British Aerospace used game theory to complete the negotiation of the successful acquisition of GEC Marconi by British Aerospace. This was undertaken using an approach that quantified the various possible outcomes of different stages of the bidding and negotiating process, the purpose being to determine what and how British Aerospace should bid at each stage.

During the 1940s, mathematical models were first developed to handle in a structured way the commercial decisions that are involved: they are known under the general title of *game theory*.[[1]](#endnote-1) Game-based theory is concerned with the immediate negotiation and its related strategy: it says little or nothing about the implementation stages that follow once the negotiation has been concluded. Game theory has two clear advantages for strategy development:

1. It clarifies the *nature of the negotiation*, identifying the players, setting out their options, identifying the outcomes of each option and the sequence of events that need to take place.

2. It can predict the *optimal outcomes of some games*, particularly by permitting the manipulation of the payoffs to the players. It does this by providing insights into the nature of the relationships that exist between players, including the identification of the competitors and co-operators.[[2]](#endnote-2)

Game theory attempts to predict competitor reactions in the negotiating situation. The circumstances may be regarded as being like a game of chess, where anticipation of the opponent’s moves is an important aspect of the challenge. Much of game theory has been modelled mathematically, with the rules specifying how the scarce resources of the company can be employed and what benefits will be obtained by particular moves or a combination of moves – the benefits are often called *payoffs*.[[3]](#endnote-3)

 In a *zero-sum game*, there is ultimately no payoff because the gains of one member are negated by the losses of another.

 In a *co-operative game*, the benefits may add up to a positive payoff for all.

 In a *negative-sum game*, the actions of each party undermine both themselves and their opponents.

Although game theory has provided a useful basis for structuring negotiations and the consequences of each move, it has proved difficult to model strategic options and decisions which are often highly complex and interrelated. Probably the most interesting strategic insights provided by game theory are in the likely outcomes of various stages of the negotiation process. For example, when British Aerospace was negotiating the restructuring of the European defence industry, it used game theory to show that it was useful to acquire GEC Marconi for two reasons:

1. The increased size gave it much greater influence on the final shape of the pan-European consolidation game.

2. The acquisition reduced the number of options available in the industry, thus lowering the number of moves that it would take to achieve the consolidation required.

Given these advantages, the issue is how to make use of game theory to analyse and conduct competitive strategic games. There are six essential steps in what is essentially a prescriptive process.

Example: Six steps to playing strategic games in Formula 1 Racing strategy

More generally, the mechanics and logical decision-making aspects of game theory are well represented in the various theoretical descriptions. But they say little about other vital aspects of most strategic negotiations. The leadership of the teams involved, the personalities and cultures of their members, the ambitions and the history of the players are not covered at all. The strategic context in which negotiations are taking place can lead to consequences that go well beyond the mathematics of game theory. For example, in the European defence industry case, the various personalities of the leading chief executives and their other responsibilities influenced the outcome of the game: George Simpson was determined to sort out the GEC Group that he had inherited, while Jürgen Schrempp at Daimler was preoccupied with the massive merger with Chrysler.

To capture some of these practical complexities of negotiation, the *Six Steps to Playing Strategic Games* checklist on the book’s website has been constructed. Readers may care to note that it can be used not only for acquisitions but for many other negotiation situations, including personal strategies. There are four aspects of game theory in the checklist that are worth highlighting here:

1. *Viewpoint of the game*. It is important to assess the game not just from one player’s perspective of the outcome. It is essential to gauge what rivals expect to take out of the game and possibly make some attempt to accommodate this.

2. *Rewrite the rules of the game*. The outcome of some games can be altered by totally rewriting the way that the game is played, even part-way through the game. In this sense, game theory is not like chess or football. This can provide a real opportunity.

3. *Reassessment of the game*. It is usually worth reconsidering whether a game is worth pursuing part of the way through the game. Some negotiations can simply be a waste of time and resources.

4. *Reassurance about the outcome*. In any game, even where there are multiple winners, it is worth remembering that people are involved. Players need to be reassured after the outcome that it was the best that could be achieved.

Although game theory can be helpful in certain limited circumstances, it focuses mainly on one small area of the strategic process – the *options and choice* part of the prescriptive process. Game theory has nothing substantial to offer about the earlier analysis phase or the later implementation phase of the prescriptive process.

Comment

There are three main problems with game theory in negotiation-based strategy:[[4]](#endnote-4)

1. The mathematical complexity makes the analytical results useful but limited. Moreover, it assumes that a dynamic and interacting environment can be modelled by a series of static equilibria. This is a dangerously simple approximation of reality.

2. Many of its conclusions, especially about Nash equilibria, are ambiguous and based on a narrow view of context. For example, game theory largely excludes all psychological insight. Game theory has so far proved incapable of handling the many complexities of real business situations.

3. Importantly, game theory focuses on a small fraction of the strategic process. For example, it provides no insight whatsoever into the development of the competitive resources of the organisation, nor any useful guidance on the massive task of implementing whatever has been negotiated.

Key strategic principles

 Game theory attempts to predict the outcomes of customer reactions or, in some cases, to show how the outcome of negotiations may well produce a suboptimal solution unless both sides of the negotiations realise the consequences of their actions.

 Game theory has some value in negotiations but suffers from three difficulties: mathematical complexity; ambiguous conclusions; being only one small part of the strategy process.

1. Useful introductory texts include: Nalebuff, B and Brandenburger, A M (1997) Co-opetition, HarperCollins Business, London; Schelling, T C (1980) The Strategy of Conflict, 2nd edn, Harvard University Press, Cambridge, MA; also Dixit, A and Nalebuff, B (1991) Thinking Strategically: the Competitive Edge in Business, Politics and Everyday Life, W W Norton, New York. [↑](#endnote-ref-1)
2. Nalebuff, B and Brandenburger, A M (1997) Op. cit., Ch 2. [↑](#endnote-ref-2)
3. Dixit, A and Nalebuff, B (1991) Op. cit. [↑](#endnote-ref-3)
4. Amongst the critical comments on game theory, it is worth consulting: Camerer, C F (1991) ‘Does strategy research need game theory?’, Strategic Management Journal, 12, Winter, pp 137–152. Postrel, S (1991) ‘Burning your britches behind you’, Strategic Management Journal, Special Issue, 12, Winter, pp 153–155. See also Fisher, F M (1989) ‘The games economists play: a noncooperative view’, RAND Journal of Economics, 20, pp 113–124. [↑](#endnote-ref-4)