APPLICATION 14.2

Chicken in Orbit: Winning the Battle for Satellite Radio in North America[9]

The emerging satellite radio market in North America (United States and Canada) serves as a possible example of a high-stakes game of Chicken unfolding in the mid- to late 2000s. Like satellite television, satellite radio involves the transmission of radio signals by means of several satellites orbiting the Earth. Satellite radio involves the possibility of offering radio listeners near-perfect reception of over a hundred channels that appeal to all manner of tastes. The service is thought to be particularly appealing to drivers (such as commercial truckers) who have to travel long distances and traverse many local radio markets. Since 2001, two firms—XM Satellite radio and Sirius Satellite Radio—have been fighting to dominate the emerging satellite radio market in North America.

The business of satellite radio involves high fixed costs and low marginal costs, because once a company launches a satellite and acquires the rights to programming (e.g., the rights to carry NFL games or NASCAR races), the marginal cost of adding one more subscriber to its subscription base is relatively low. A key implication of this is that for a satellite radio company to break even, it needs a critical mass of subscribers. Although the market for satellite radio in North America is thought to have great potential (one estimate suggests that the potential market by the year 2011 will be 20 million subscribers), it is possible that the market may not be large enough to allow more than one firm to make a profit. Making this problem even more severe for XM and Sirius is the fact that the two companies use incompatible technologies. The receiver that you need to buy to subscribe to Sirius's service (which you can buy at auto supply or electronics stores or from a car dealer) could not be used to receive XM's service if at some point you wanted to switch from one service to the other. Not knowing which service will ultimately prevail may make consumers reluctant to invest the $150 needed to purchase the appropriate receiver, making it all the more difficult for the two firms to coexist profitably in this market.

Given these realities, it is conceivable that the satellite radio market in North America is a natural monopoly. If so, the battle between XM and Sirius to "win" this market can be understood as a game of "Chicken." Table 14.8 shows how we can use game theory to predict the possible outcome of the battle to dominate the North American satellite radio market. In the table, two firms, XM and Sirius, have the choice of staying in the market or exiting. The payoffs in the table are hypothetical cumulative profits that the firms would be expected to earn under various competitive scenarios.[10] If (for the sake of illustration) we assume that the market can only support one profitable firm and both firms choose to remain in the market, each firm would be expected to incur significant losses. However, if one firm were to exit the market, the remaining firm would make a profit.

The game in Table 14.8 has two Nash equilibria: In one, XM chooses "stay" and Sirius chooses "exit," while in the other, Sirius chooses "stay" and XM chooses "exit." Game theory, by itself, cannot tell us which of these two Nash equilibria is likely to arise. We need to know more about the players and the particular circumstances they face in order to make predictions about who will win.

As of 2007, the future of the satellite radio market is still not clear, but it looks as though XM is about to "swerve" and exit the market by merging with its rival. Sirius has offered $4.29 billion to purchase the holdings of XM. The United States Department of Justice will review the proposed merger to determine whether the competition from free radio, other forms of digital radio, and iPods will prevent a monopolist in satellite radio from having the power to raise prices too much. (In an effort to win approval for the merger, Sirius Chief Executive Mel Karmazin offered to hold subscription prices at current levels for existing customers.) It will be interesting to see how this market plays out in the next five or ten years.[11]

TABLE 14.8 The Game of Chicken between XM and Sirius*

		Sirius: Stay	Sirius: Exit
XM	Stay	−200, −200	300,0
	Exit	0,300	0,0

*Payoffs are in millions of dollars.

[10]Technically, the payoffs in Table 14.8 should be thought of as the present value of the profits (or losses) into the future. A present value of a stream of profits involves adding up the stream of profits over a period of years with the twist that we discount profits received in later years to take into account the fact that a dollar of profit received 10 years from now is worth less than a dollar of profit received today. You can find a good introduction to present value in a basic corporate finance textbook, such as R. A. Brealey and S. C. Myers, *Principles of Corporate Finance* (New York: McGraw-Hill, 1998).

[11]"Satellite Radio Cost to Freeze," *Chicago Tribune*, Bloomberg News, March 8, 2007, section 3, p. 4.