

Simulating oligopoly to enhance student learning

Christopher S. Ruebeck
Lafayette College

Joseph E. Harrington, Jr.
Johns Hopkins University



Introduction

How well do students understand price theory, market power, strategic interaction, and oligopoly theory? We describe Virtual Corporate Reality (VCR), an extra-classroom activity designed to engage students' contemplation of and experience with these ideas. Students compete in teams over the course of the semester in a price and location game based on Salop's (1979) circular city. Our experience is that VCR increases students' internalization of concepts such as best-response, Nash equilibrium, predatory pricing, and even ideas as seemingly straightforward as pricing above marginal cost. They find it both entertaining and edifying, and come to class better prepared to understand the assumptions, structure, and predictions of oligopoly theory. Students receive significant feedback on their success at mastering and internalizing these concepts.

Learning objectives

Understand the profit incentive

- *Effect of price changes on revenues*
- *Cost/benefit of investment decisions*
- $P > MC$ for firms with market power
- *Other firms' losses not always your firm's gain*

Integrate details of product differentiation

Anticipate others' strategic decisions

Grasp intuition behind the theory

- *Best response*
- *Nash equilibrium*

Communicate insights in writing.

Work as a team

Finances

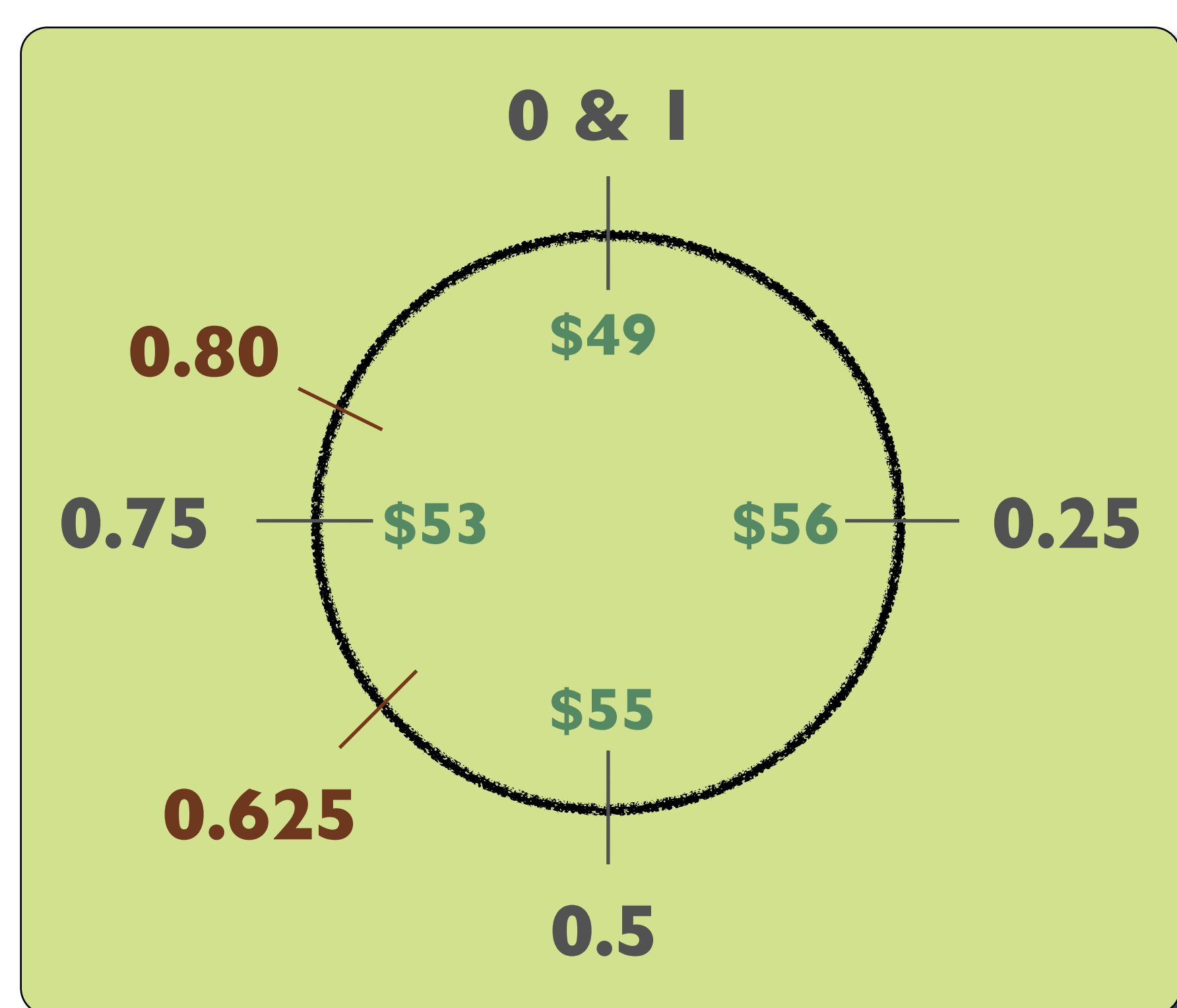
Along with one product, each team starts the game endowed with \$25,000,000. Each period, the team is charged as follows:

- [+] 5% interest on period's cash balance
- [+] revenue on all the firm's products
- [-] cost of firm's production
- [-] cost-reducing investment
- [-] # of product introductions \times \$5,000,000
- [+] # of products withdrawn \times \$1,000,000
- [-] # of product relocations \times \$2,500,000
- [+/-] Other sales or purchases (auctions)

There are no loans and no bankruptcy law.

Overview of the game

Student teams are endowed with one product, located evenly around the unit circle. During each period, they make decisions on price(s) for existing products, invest in cost-reducing innovation, and can introduce, withdraw, or relocate products. The game is deterministic. Anti-trust laws apply: students are warned that collusion is equivalent to cheating, with similar punishments.



In the example pictured above, there are four teams, each initially endowed with a product spaced evenly around the unit circle (0/1, 0.25, 0.5, 0.75). Each team has announced a price for their existing products (shown inside the circle), and two product introductions have been made at 0.80 and 0.625.