ENTRY AND EXIT 1

Context and concepts

Context: You are entering a new market. How can you discourage rivals from entering, too?

Concepts: entry, commitment, cheap talk, irrationality as conscious strategy.

An entry game

- Two firms, each deciding whether to enter a new market
- Rules of the game:
  - Entry decisions simultaneous
  - Entry involves sunk cost $s=1$
  - If both enter, profits are zero.
  - If only one firm enters, profit is $\pi$.
  - $\pi$ can be high (2.1) or low (1.9) with equal probability.
  - Each firm knows its own value of $\pi$ but not the rival's. It is known a priori that $\pi$ can be high or low with equal probability.
- What's the outcome?

Entry game...

- This (sort of) fits into a matrix:

<table>
<thead>
<tr>
<th></th>
<th>Enter</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>1.1</td>
<td>1.0</td>
</tr>
<tr>
<td>Low</td>
<td>-1</td>
<td>-1</td>
</tr>
</tbody>
</table>

- One equilibrium is for one firm to enter
  - For the entrant: $\pi>1$, so entry is best
  - For the non-entrant: $0>1$, so staying out is best
- Of course it's symmetric: the other firm could enter, too.

Entry game...

- There's also a third equilibrium:
  - Each player enters if its monopoly profits are high, stays out if monopoly profits are low.
  - From Firm 1's perspective, Firm 2 enters with probability 50%. This implies a that payoff from entering is:
    - 2.1 times 50% - 1 = .05 if high $\pi$
    - 1.9 times 50% - 1 = -.05 if low $\pi$
  - Hence, proposed strategies are indeed equilibrium.
- Comment: Two firms enter with 25% probability. Entry mistakes can happen!
- Examples: wide-body aircraft, satellite TV in Britain
- Question: Is there a way for one firm to commit to entry and thus deter the other?

Commitment

- For many decisions, it's useful to have lots of options.
- In games, it's sometimes useful to have fewer options: to eliminate moves that lead to unattractive equilibria. We refer to this limitation of your options as "commitment" (as in, you're committed to a particular course of action).
- In the previous game, suppose you were able to persuade your rival that you had no choice but to enter. Then she would not enter and you get the most attractive equilibrium (you have the market to yourself).
- Commitments need to be observed and believed to work.
**HDTV game 1: simultaneous**

<table>
<thead>
<tr>
<th>Effort by Japan</th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>High</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

**HDTV game 2: sequential**

If US moves first (commits to a strategy), it can dictate the play:

```
<table>
<thead>
<tr>
<th></th>
<th>H</th>
<th>J</th>
</tr>
</thead>
<tbody>
<tr>
<td>U</td>
<td>(2,4)</td>
<td>(3,2)</td>
</tr>
<tr>
<td>L</td>
<td>(1,1)</td>
<td>(3,2)</td>
</tr>
</tbody>
</table>
```

The question: how to commit.

**HDTV game: summary**

- With simultaneous moves, it is a dominant strategy for US to choose L. The Nash equilibrium is (L,H), yielding the US a payoff of 2.
- If US can commit (play first), then the equilibrium is different: US chooses H, Japan L. Payoff for US is 3.
- The value of commitment in this example is 3 - 2 = 1.
- Comment: Two can play this game. I.e., why doesn't Japan commit itself, too?
Commitment and irrationality

In *The Maltese Falcon*, Caspar Gutman (Sidney Greenstreet) threatens to kill Sam Spade (Humphrey Bogart) unless the latter gives him the “black bird” (the falcon). Gutman threatens to kill Spade, who seems unimpressed by the threat:

The Spade/Gutman game

<table>
<thead>
<tr>
<th></th>
<th>be cooperative</th>
<th>be uncooperative</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>$500K, $500K</td>
<td>$1m, -1</td>
</tr>
<tr>
<td>G</td>
<td>$1m, 0</td>
<td>$1m, -1</td>
</tr>
</tbody>
</table>

Gutman is rational (1−p)

not kill

Gutman is irrational (p)

$1m

$-∞

$-∞

$500K

$500K

$1m

$-1

$1m

$1m

$-1

Dr Strangelove

The Russian Ambassador and the President of the U.S.

The End

The doomsday machine

DeSadeski: The doomsday machine.

Muffley: The doomsday machine? What is that?

DeSadeski: A device which will destroy all human and animal life on earth.

Muffley: I’m afraid I don’t understand something, Alexiy. Is the Premier threatening to explode this if our planes carry out their attack?

DeSadeski: No sir. It is not a thing a sane man would do. The doomsday machine is designed to trigger itself automatically.

Muffley: But surely you can disarm it somehow.

DeSadeski: No. It is designed to explode if any attempt is ever made to untrigger it.

Doomsday machine...

Muffley: Dr. Strangelove, do we have anything like that in the works?

Strangelove: A moment please, Mr. President. Under the authority granted me as director of weapons research and development, I commissioned last year a study of this project by the Bland corporation. Based on the findings of the report, my conclusion was that this idea was not a practical deterrent, for reasons which, at this moment, must be all too obvious.

Muffley: Then you mean it is possible for them to have built such a thing?

Strangelove: Mr. President, the technology required is easily within the means of even the smallest nuclear power. It requires only the will to do so.

Doomsday machine...

Comment: It’s not enough for you to have a credible commitment. It’s also important that the other party knows that you have a credible commitment.
Commitment examples

- Polaroid v Kodak
- Dupont’s capacity expansion
- Xerox’s lease-only policy
- Intel’s second-sourcing policy

Takeaways

- Entry is a tricky business: If too many firms enter, it’s possible none make any money.
- Commitment is the art of limiting your options for strategic advantage.
- The commitment must be known and believed by others.
- Behaving irrationally (or making your rivals think you are) may also be to your strategic advantage.