

3 stackelberg competition and endogenous entry

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The Stackelberg Strategy**

The Stackelberg strategy is a game theory model in which one player (the leader) moves before the other player (the follower). The leader's action influences the follower's decision, giving the leader a strategic advantage.

The Stackelberg Model

The Stackelberg model formalizes the Stackelberg strategy. It assumes that the leader knows the follower's reaction function (how the follower will respond to the leader's move) and anticipates it in their own decision-making.

Real-Life Example of a Stackelberg

- **Microsoft and Apple:** Microsoft (the leader) sets the price of its operating system, which influences Apple's (the follower) pricing strategy for its computers.

Stackelberg Game Method

1. The leader chooses an action (e.g., price).
2. The follower observes the leader's action and responds (e.g., sets its own price).
3. The outcome is determined based on the leader and follower's actions.

Outcome of Stackelberg Model

The typical outcome of the Stackelberg model is that the leader earns a higher profit than the follower due to their strategic advantage.

Problem with Stackelberg

The main problem with the Stackelberg model is its sensitivity to the leader's assumptions about the follower's reaction function. If the leader inaccurately predicts the follower's response, the model may not provide reliable results.

When to Use the Stackelberg Model

The Stackelberg model is most appropriate when:

- The leader has a clear strategic advantage over the follower.
- The leader can credibly commit to its action.
- The follower has limited information about the leader's costs.

Does Stackelberg Leader Always Make More Profit Than Follower?

Not necessarily. The follower can earn a higher profit if it can outsmart the leader by anticipating its move and reacting strategically.

How to Solve Stackelberg Oligopoly

Solving a Stackelberg oligopoly involves finding the leader's optimal action and the follower's best response. This can be done using game theory techniques.

First Mover Advantage of Stackelberg Model

The Stackelberg leader has a first mover advantage because it can choose its action before the follower. This advantage can increase the leader's profit and market share.

Nash and Stackelberg Strategies

In a Nash equilibrium, both players choose actions that maximize their payoffs given the other player's actions. In a Stackelberg equilibrium, the leader chooses an action that maximizes its payoff, taking into account the anticipated response of the

follower.

How to Draw a Stackelberg Graph

A Stackelberg graph is a graphical representation of the game. It shows the payoffs to both the leader and the follower for different possible actions.

Assumptions of Stackelberg Model

- The leader moves first.
- The follower observes the leader's action.
- The leader knows the follower's reaction function.
- The players are rational and profit-maximizing.

Existence of Stackelberg Equilibrium

A Stackelberg equilibrium may not always exist. It depends on the specific characteristics of the game, such as the payoff functions and the information available to the players.

Difference Between Bertrand and Stackelberg

In a Bertrand game, both players choose prices simultaneously, while in a Stackelberg game, the leader sets the price first.

Difference Between Cournot and Stackelberg

In a Cournot game, both players choose quantities simultaneously, while in a Stackelberg game, the leader sets the quantity first.

Formula for Stackelberg Model

The optimal action for the Stackelberg leader is determined by solving the following equation:

$$Q_L = \arg \max Q_L(Q_L, Q_F)$$

where:

- Q_L is the leader's quantity
- Q_F is the follower's quantity
- π_L is the leader's profit function

Stackelberg Equilibrium in Economics

In economics, a Stackelberg equilibrium is a market situation in which one firm (the leader) has a cost advantage over other firms (the followers). This advantage allows the leader to set a higher price or produce a larger quantity than the followers.

Stackelberg Outcome

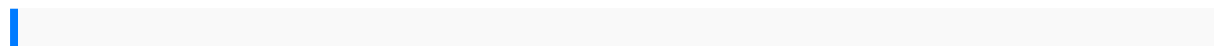
The Stackelberg outcome is the result of the leader's strategic decision-making. The leader chooses an action that maximizes its profit, given the anticipated response of the followers.

Strong Stackelberg Equilibrium

A strong Stackelberg equilibrium is a Stackelberg equilibrium in which the leader's profit is guaranteed to be higher than any other player's profit, regardless of the follower's response.

Stackelberg Pricing Game

A Stackelberg pricing game is a type of game in which the leader chooses a price before the follower. This gives the leader a strategic advantage and can lead to higher profits for the leader.



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