July 2025

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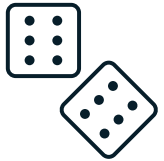
Understanding Game Theory with Pop Culture



What is Game Theory?

Game Theory in Real Life

Game Theory in the Classroom

Payoff Matrix Examples

What is Game Theory?

"Game theory is a branch of mathematics and economics that studies how people make strategic decisions when success depends on the decisions of others. It examines how people or groups interact, taking into account their preferences, strategies, and likely outcomes"

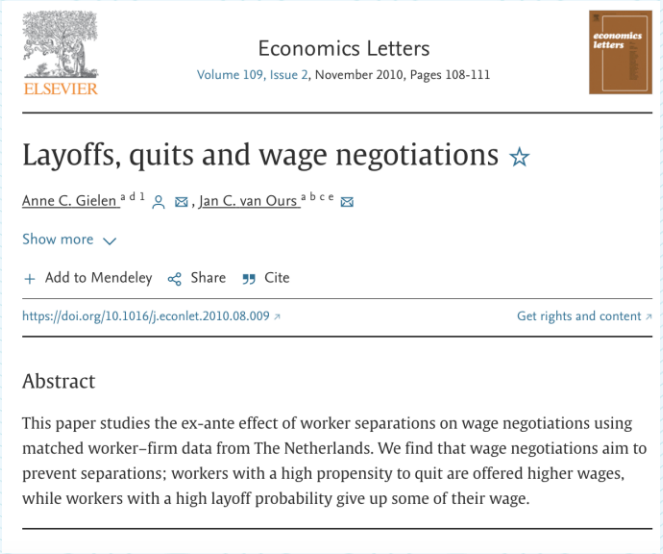
- Daryl Fairweather, Ph.D. (Hate the Game)

Game Theory in Real Life

Careers/Jobs – Negotiating for a higher salary/wage at a job

Business Decision Making – Deciding how much to charge for a product

Relationships – Deciding whether to ask your crush to the prom



ELSEVIER

Economics Letters

Volume 109, Issue 2, November 2010, Pages 108-111

Layoffs, quits and wage negotiations ☆

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Abstract

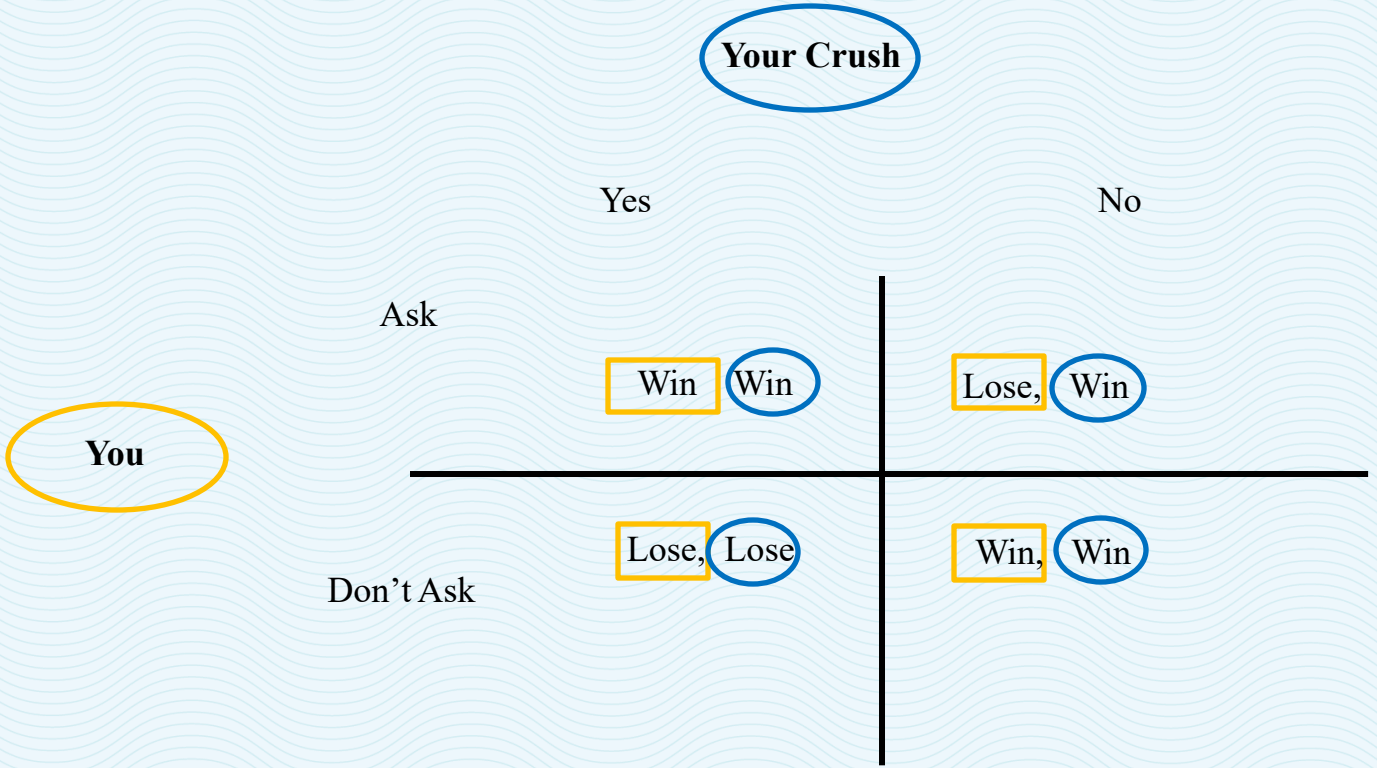
This paper studies the ex-ante effect of worker separations on wage negotiations using matched worker–firm data from The Netherlands. We find that wage negotiations aim to prevent separations; workers with a high propensity to quit are offered higher wages, while workers with a high layoff probability give up some of their wage.

- A **game** is a situation in which a number of individuals take actions, and the payoff for each individual depends directly on both the individual's own choice and the choices of others.

- A **strategy** is a complete plan of actions for playing a game; the normal form model of a game shows the payoffs that result from each collection of strategies (one for each player).

- A player has a **dominant strategy** when the payoff to a particular action is always higher independent of the action taken by the other player.

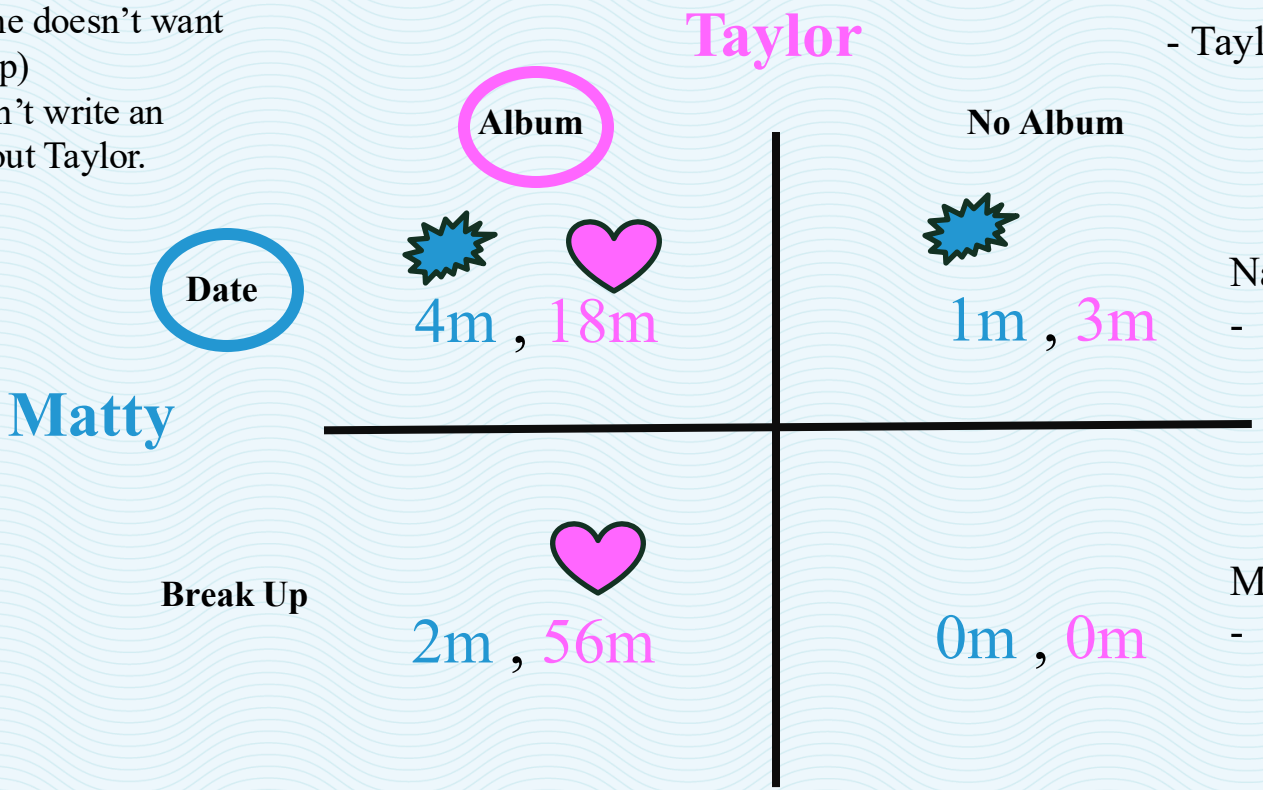
- A **Nash equilibrium** is a condition describing the set of actions in which no player can increase his or her payoff by unilaterally taking another action, given the other players' actions.


Your Crush
Yes
No
Ask
You
Win
Win
Lose,
Win
Lose,
Lose
Win,
Win
Don't Ask

Game Theory (Taylor's Version)

Assumptions:

1. Taylor is ready to marry Matty. (She doesn't want to break up)
2. Matty won't write an album about Taylor.



Dominant strategies?

- Matty – Date Taylor!
- Taylor – Make an album!

Nash equilibrium?

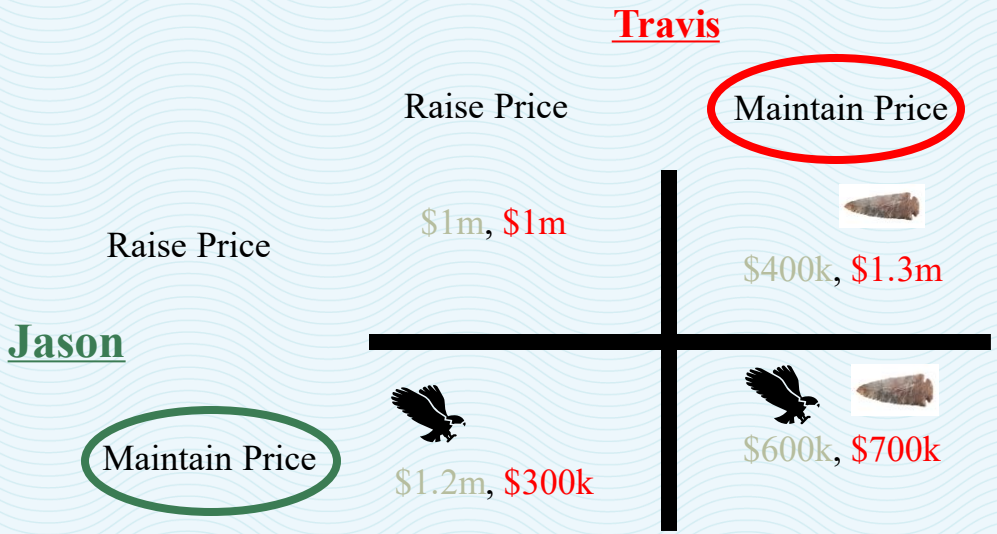
- Date and make an album

Maximize total profits?

- Collude, "Break up" and make album

Football Game Theory

Many companies want to hire **one** of the Kelce brothers to star in their commercials. Each brother must decide whether or not to raise the price they charge to appear in commercials. **They are not cooperating with one another on this decision.** The matrix shows the profit each brother makes associated with each pair of pricing strategies



Assuming the brothers know the information in the matrix, which is the dominant strategy for each brother?

Each brother has a dominant strategy to maintain the price.

End Game Theory

Scooter currently owns Taylor's album *Reputation.* Scooter is currently making money off the album streams. Taylor has the choice to re-record *Reputation,* so fans stream the new version instead of Scooter's. Scooter has the choice to sell the album to investors.

A) Does Taylor have a dominant strategy?

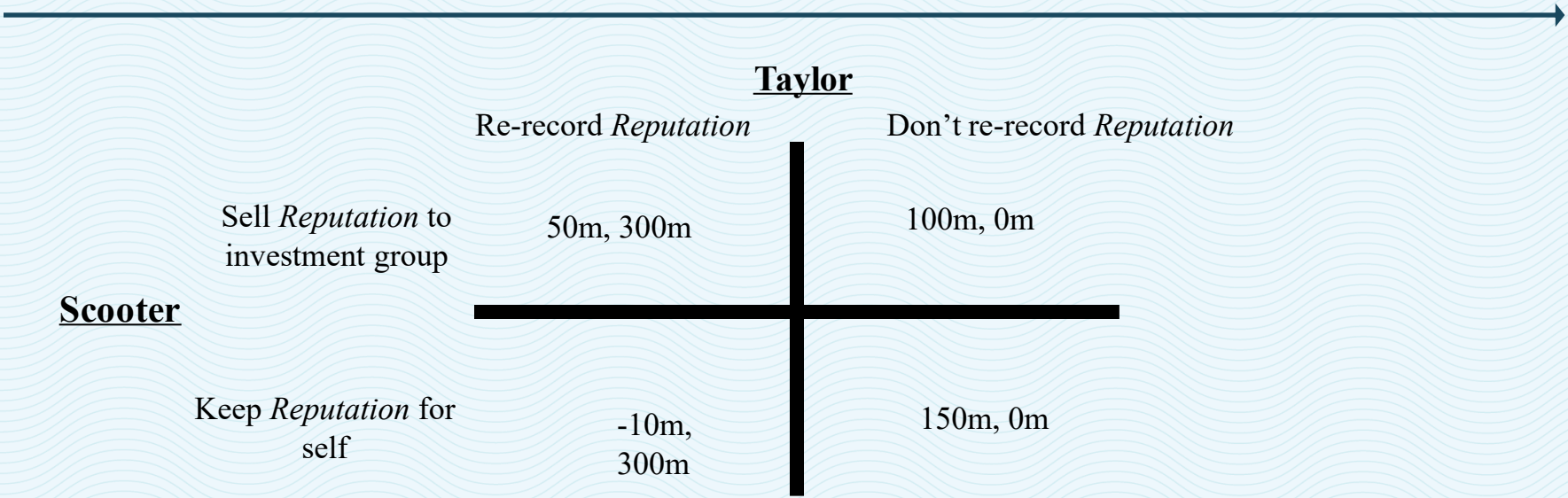
Yes, Taylor should re-record reputation.

B) Does Scooter have a dominant strategy?

No, Scooter's optimal choice depends on Taylor's decision.

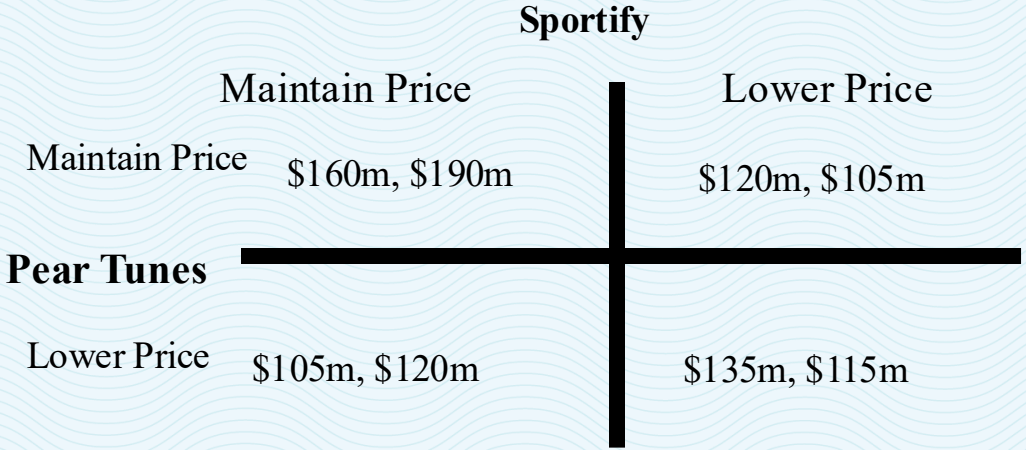
C) Identify the Nash equilibrium:

Scooter should sell Reputation and Taylor should re-record it.



Musical Game Theory

Two companies provide music streaming services to customers. A huge artist on both platforms has recently changed the cost of her music license fees for streaming. Both companies must decide whether to lower their subscription price or maintain it. Both companies know the information in the matrix.



A) If Pear Tunes chooses to maintain their price, which strategy is better for Sportify?

A) Sportify should maintain their price.

B) Is there a dominant strategy for Pear Tunes? Explain.

B) No there is not a dominant strategy for Pear Tunes. Pear Tunes' best move depends on Sportify's decision.

C) Assume these companies make their decisions at the same time, without cooperating. What is their profit?

C) The profit for Sportify would be $190m and for Pear Tunes it would be $160m.

D) If these two firms could cooperate, which strategy would each firm choose?

D) Each would choose to maintain the price as they both make more money that way.

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Questions