

Lecture 4

The Logic of Rational Thought

Even when the Nash equilibrium is unique, the prediction is more compelling in some games than others. This lecture develops that theme, by explaining principles that are more powerful than Nash equilibrium in predicting game outcomes.

Key words and phrases:

dominant strategies, dominated strategies, iterative dominance.

Dominant strategies

- ◆ Strategies that are optimal for a player regardless of what the other players do are called **dominant**.
- ◆ Although a player's payoff might depend on the choices of the other players, when a dominant strategy exists, the player has no reason to introspect about the objectives of the other players in order to make his own decision.
- ◆ Similarly when a dominant strategy exists, the player does not need to know the behavior of the other players to form his or her best response to the probability distribution characterizing their choices.

Always play a dominant strategy if one exists.

Acquiring Federated Department Stores

- ◆ The prisoners' dilemma is clearly an artifice designed to illustrate some basic concepts. We turn now to an episode in the history of mergers and acquisitions.
- ◆ Robert Campeau and Macy's are competing for control of Federated Department Stores in 1988.
- ◆ If both offers fail, then the market price will be benchmarked at 100. If one succeeds, then any shares not tendered to the winner will be bought from the current owner for 90.
- ◆ The argument here is that losing minority shareholders will get burned by the new majority shareholders.

Campeau's offer . . .

- ◆ Campeau made an **unconditional two tier** offer. The price paid per share would depend on what fraction of the company Campeau was offered.
- ◆ If Campeau got less than half, it would pay 105 per share. If it got more than half, it would pay 105 on the first half of the company, and 90 on any remaining shares.
- ◆ Each share tendered would receive a blend of these two prices so that every share received the average price paid. If a percentage $x > 50$ of the company is tendered, then $50/x$ of them get 105, and $(1 - 50/x)$ of them get 90 for a blended price of:

$$105 * 50/x + 90(1 - 50/x) = 90 + 15(50/x).$$

Macy's offer . . .

- ◆ Macy's offer was conditional at a price of 102 per share: it offered to pay 102 for each share tendered, but only if at least 50% of the shares were tendered to it.
- ◆ Note that if everyone tenders to Macy's, they receive 102 per share, while if everyone tenders to Campeau, they receive 97.50. so, shareholders are collectively better off tendering to Macy's than to Campeau.

The game between shareholders

- ◆ After the offers are made, Federated shareholders play an acceptance/rejection game.
- ◆ Each shareholder asks what proportion of their shares should be:
 1. sold to Macy's
 2. sold to Campeau's
 3. retained.
- ◆ Note the payoffs received by each shareholder depend on what the other shareholders do.

Acquiring Federated Department Stores and instruction window

1. Instruction and tender window appears on your screen.
2. To close the instruction window click on "x". To retrieve it click on "Description".

ComLabGames - Client
Description Username: Marco Id: 9 Identity: 4

Acquiring Federated Department Stores

Number of shareholders participating: 4

You have 100 shares available. You have to decide how many shares you want to tender to Cameau, Macy and how many shares you do not want to tender. The total number of shares tendered and not tendered cannot exceed 100 shares available to you.

Write your tender:

Tender to Cameau	Tender to Macy's	Do not tender
0	0	0

and click continue.

Stage time limit: unlimited Round: 1 Continue

Player type:shareholder (4) Please make a move now!

Waiting 4 of 4 subject(s) to proceed the session!

ComLabGames - Client
Instructions Username: Amanda Id: 7 Identity: 2

Acquiring Federated Department Stores Instructions

Robert Campeau and Macy's are competing for control of Federated Department Stores. You are one of 4 shareholders. You have 100 shares available to tender. You have to decide how many shares you want to tender to Cameau, Macy and how many shares you do not want to tender. The total number of shares tendered and not tendered cannot exceed 100 shares available to you.

1. If you tender to Campeau and Campeau gets less than half, it will pay 105 per share. If it gets more than half, it will pay 105 on the first half of the company, and 90 on any remaining shares.
2. Macy offers to pay 102 for each share tendered, but only if at least 50% of the shares are tendered to Macy.
3. If offers to Campeau and Macy fail, then the market price will be benchmarked at 100. If one succeeds, then any shares not tendered to the winner will be bought from the current owner for 90.

Each of you submits a tender simultaneously. Once everybody submits a tender the game is closed.

You will be asked to type number of shares that you want to tender to Cameau, Macy and the number of shares that you do not want to tender in the table like the one below:

Tender to Cameau	Tender to Macy's	Do not tender
0	0	0

and then you will be asked to click continue to confirm your submission. If you do not click continue your tender will not be confirmed. The tenders to Cameau, Macy and shares that were not tendered cannot exceed 100 available shares.

Each of you will be making the tenders simultaneously. Once everybody makes a decision, you will be asked to review your decision. If your tender does not exceed 100 then click continue otherwise revise your tender.

Your income is the sum of income from tendering to Cameau (Campeau price*number of shares tendered to Cameau), tendering to Macy (Macy price*number of shares tendered to Macy) and the income from not tendering (Price for not tendering*number of shares not tendered).

Write number of shares to tender

1. Write numbers for Campeau, Macy and for "Do not tender" and click "Continue".
2. Total number of shares tendered cannot exceed 100. You will have a chance to revise the tender after you click "Continue".
3. Wait for all players in your session to submit tender.

ComLabGames - Client

Description Username: Marco Id: 7 Identity: 4

Acquiring Federated Department Stores

Number of shareholders participating: 4

You have 100 shares available. You have to decide how many shares you want to tender to Cameau, Macy and how many shares you do not want to tender. The total number of shares tendered and not tendered cannot exceed 100 shares available to you.

Write your tender:

Tender to Campeau	Tender to Macy's	Do not tender
0	0	0

and click continue.

Stage time limit: unlimited Round: 1 Continue

Player type:shareholder (4) Please make a move now!

Waiting 4 of 4 subject(s) to proceed the session!

ComLabGames - Client

Description Username: Marco Id: 7 Identity: 4

Acquiring Federated Department Stores

Number of shareholders participating: 4

You have 100 shares available. You have to decide how many shares you want to tender to Cameau, Macy and how many shares you do not want to tender. The total number of shares tendered and not tendered cannot exceed 100 shares available to you.

Write your tender:

Tender to Campeau	Tender to Macy's	Do not tender
60	20	30

and click continue.

Sum $60+20+30 = 110$ exceeds 100 and Marco will be prompted to revise the tender on the revised page

Stage time limit: unlimited Round: 1 Continue

Player type:shareholder (4) Please make a move now!

Tender revised

1. Update numbers for Campeau, Macy and for "Do not tender" if your total numbers of shares tendered **exceeds 100** and click "Continue".
2. If your total numbers of shares tendered equals 100 click "Continue".
3. Wait for all players in your session to submit tender.

ComLabGames - Client

Description Username: Marco Id: 7 Identity: 4

Tender revised

Your total number of shares that you tendered to Campeau, Macy and the number of shares not tendered was **110**.

If **110** tendered and not tendered shares exceeds **100** shares available revise it, otherwise click continue.

Tender to Campeau	Tender to Macy's	Do not tender
60	20	30

$60 + 20 + 30 = 110 > 100$.
Subject Marco has to revise the tender

Stage time limit: unlimited Round: 1 Continue

Player type:shareholder (4) Please make a move now!
Waiting 4 of 4 subject(s) to proceed the session!

ComLabGames - Client

Description Username: Marco Id: 7 Identity: 4

Tender revised

Your total number of shares that you tendered to Campeau, Macy and the number of shares not tendered was **110**.

If **110** tendered and not tendered shares exceeds **100** shares available revise it, otherwise click continue.

Tender to Campeau	Tender to Macy's	Do not tender
70	0	30

Revised tender: $70 + 30 = 100$

Stage time limit: unlimited Round: 1 Continue

Player type:shareholder (4) Please wait for other players to make their choices!
Waiting 3 of 4 subject(s) to proceed the session!

Summary of results

1. Results show your own final number of shares tendered, Income for each tender and total income earned.
2. Summary for your own session.

ComLabGames - Client

Description

Username: Marco

Id: 27

Identity: 4

Summary of results

Your final tenders were:

Tender to Campeau	Tender to Macy's	Do not tender	Campeau income	Macy income	Income from not tendering	Total income
70	0	30	7254.55	0	2700	9954.55

The summary data for all sessions is listed below:

Player's userna...	Tender to Cam...	Tender to Macy	Do not tender	Campeau Price	Macy Price	No Tender Price	Total Income
Nora	50	40	10	103.64	90	90	9681.82
Simone	70	10	20	103.64	90	90	9954.55
Jason	30	30	40	103.64	90	90	9409.09
Marco	70	0	30	103.64	90	90	9954.55

Share of Campeau	Share of Macy	Share of No Tender
0.55	0.2	0.25

Stage time limit: unlimited

Round: 1

Continue

Player type:shareholder (4) Please make a move now!

The payoff matrix to a stockholder

	Campeau succeeds	Macy's succeeds	Both fail
Tender to Campeau	$90 + 15(50/x)$	105	105
Tender to Macy's	90	102	100
Do not tender	90	90	100

The beauty of coordination

- ◆ Collectively shareholders are better off tendering to Macy's.
- ◆ But if individual shareholders cannot affect who wins, each is better off tendering to Campeau, regardless of what the other players do.
- ◆ That caveat aside, each shareholder has a **dominant strategy** to induce a Nash equilibrium that makes all shareholders worse off than they could be (just like the prisoners' dilemma).
- ◆ Can the shareholders **coordinate**?
 - Suppose Macy's receives 50 percent plus one share and the remaining shares are tendered to Campeau
 - If any shareholder offers more than the agreed amount, then Campeau wins, and instead receiving 102 for the extra shares sold to Campeau, the deviating shareholder only receives 90.
 - In this (tacit) agreement, each shareholder is **pivotal**.
 - This proves that an agreement between shareholders could be struck to extract the maximal gains for selling their shares. It constitutes **another NE**.

Governance

◆ This case study also illustrates the costs of diffuse ownership:

- Individual shareholders can reduce their **risk exposure** by owning small stakes in many firms, rather than large stakes in a few.
- However, if there are many owners in a firm, each with a small stake, then no one has much **incentive** to tend to the firm's profitability.
- Similarly, if an asset management firm holds a large portfolio, it faces **internal challenges** capitalizing on proprietary research it undertakes to increase the value of its fund.

Dominated strategies

- ◆ If a player has a dominant strategy, then her other strategies are called **dominated**.
- ◆ More generally, a strategy is called dominated if there exists some other strategy yielding a higher expected payoff regardless of the strategies that the other players pick.

A person should never play a dominated strategy.

- ◆ She can earn more by choosing another strategy without knowing the choices of the other players.

Solving games of perfect information

- ◆ Games of perfect information are solved by backwards recursion.
- ◆ At the bottom node aren't we just eliminating those strategies that are **dominated** by any strategy that picks out the best move at the very end of the game?
- ◆ This insight leads us to the following theorem (easily proved by an induction):

Games of perfect information can be solved by writing down their strategic form and applying iterated dominance.

Walmart and Kmart

- ◆ Consider a two round acquisition game in which Walmart may buy some of Kmart's outlets to help "rationalize" geographical sales regions.
- ◆ Insider experts agree that the sum of the increase in value to both firms from transferring ownership of these stores from Kmart to Walmart is worth \$100 million.
- ◆ Also the physical assets themselves are valued at another \$50 million.
- ◆ To summarize: if the stores are sold, the two parties Kmart and Walmart split \$150 million, but otherwise they both net zero.

Time line for acquisition game

- ◆ First Walmart makes an offer to Kmart.
- ◆ The very next instant there is a 20 percent chance that the FTC issues a ruling preventing the sale.
- ◆ Otherwise Kmart can accept the offer, or reject it.
- ◆ If Kmart rejects, Walmart has a 40 percent chance of making a second offer, but with chance, Kmart has a 60 percent of coming back first, with its own price offer.
- ◆ If a second offer is made by either party, there is a 20 percent chance FTC may belatedly prevent the sale.
- ◆ If the second offer is allowed by the FTC, but is rejected anyway by the counterparty, then no one gets anything, and Kmart retains ownership of its stores.
- ◆ In that last case the FTC stops negotiations for sure because the journalists have well and truly caught on.

Acquisition game for Walmart and instruction window

1. Instruction and acquisition window appears on your screen
2. Your role is shown at the bottom of the screen.
3. Walmart makes the offer first.
4. To close the instruction window click on "x". To retrieve it click on "Description".

ComLabGames - Client
Description Username: Nora Id: 0 Identity: 1

Round: 1

Walmart

Please write the offer to **Kmart**.

Offer to **Kmart**: and click "Continue"

Note: offer has to be greater than 0.

The very next instant there is a 20 percent chance that the FTC issues a ruling preventing the sale. Otherwise **Kmart** can accept the offer or reject it. If **Kmart** accepts the proposal **you** gain \$150 million minus the amount offered to **Kmart**; **Kmart** gains the amount it receives from **you** minus \$50 million, the value of the stores. If **Kmart** rejects, **you** will have a 40 percent chance of making a second offer, and **Kmart** has a 60 percent chance of coming back first, with its own price offer. If the stores are not sold **Kmart** keeps its \$50 million facility, and neither firm makes or loses anything.


Stage time limit: unlimited Round: 1 Continue

Player type: Walmart (1) Please make a move now!

Waiting 1 of 1 subject(s) to proceed the session!

ComLabGames - Client
Instructions Username: Nora Id: 0 Identity: 1

Instructions



Consider a two round bargaining game in which Walmart may buy some of Kmart's outlets to help "rationalize" geographical sales regions. Insider experts agree that the sum of the increase in value to both firms from transferring ownership of these stores from Kmart to Walmart is worth \$100 million. Also the physical assets themselves are valued at another \$50 million (which could be reaped by selling them to an unnamed third party).

To summarize: if the stores are sold, Walmart gains \$150 million minus the amount offered to Kmart; Kmart gains the amount it receives from Walmart minus \$50 million, the value of the stores. If the stores are not sold Kmart keeps its \$50 million facility, and neither firm makes or loses anything.

First Walmart makes an offer to Kmart. The very next instant there is a 20 percent chance that the FTC issues a ruling preventing the sale.

If the sale is allowed, Kmart can accept the offer, or reject it. If Kmart rejects the offer, Walmart has a 40 percent chance of making a second offer, and Kmart has a 60 percent chance of coming back first, with its own price offer.

If a second offer is made by either party, there is a 20 percent chance FTC may belatedly prevent the sale. If the second offer is allowed by the FTC, but is rejected anyway by the counterparty, then no one gets anything, and Kmart retains ownership of its stores.

In that last case the FTC stops negotiations for sure because the journalists have well and truly caught on.

Acquisition game window for Kmart

1. Instruction and acquisition window appears on your screen
2. Your role is shown at the bottom of the screen.
3. Kmart does not make a decision. Kmart just see how Walmart windows looks like.
4. To close the instruction window click on "x". To retrieve it click on "Description"

Description Username: Simone Id: 1 Identity: 2

Kmart: You are not Making a Decision !!!!
This Page is for you to see the information given to **Walmart**

Round: **1**

Walmart

Please write the offer to **Kmart**.

Offer to **Kmart**: and click "Continue"

Note: offer has to be greater than 0.

The very next instant there is a 20 percent chance that the FTC issues a ruling preventing the sale. Otherwise **Kmart** can accept the offer or reject it. If **Kmart** accepts the proposal **you** gain \$150 million minus the amount offered to **Kmart**; **Kmart** gains the amount it receives from **you** minus \$50 million, the value of the stores. If **Kmart** rejects, **you** will have a 40 percent chance of making a second offer, and **Kmart** has a 60 percent chance of coming back first, with its own price offer. If the stores are not sold **Kmart** keeps its \$50 million facility, and neither firm makes or loses anything.

Stage time limit Round: 1 Continue

Player type:Kmart (1) Please wait for other players to make their choices!

Waiting 1 of 1 subject(s) to proceed the session!

Instructions

Consider a two round bargaining game in which Walmart may buy some of Kmart's outlets to help "rationalize" geographical sales regions. Insider experts agree that the sum of the increase in value to both firms from transferring ownership of these stores from Kmart to Walmart is worth \$100 million. Also the physical assets themselves are valued at another \$50 million (which could be reaped by selling them to an unnamed third party).

To summarize: if the stores are sold, Walmart gains \$150 million minus the amount offered to Kmart; Kmart gains the amount it receives from Walmart minus \$50 million, the value of the stores. If the stores are not sold Kmart keeps its \$50 million facility, and neither firm makes or loses anything.

First Walmart makes an offer to Kmart. The very next instant there is a 20 percent chance that the FTC issues a ruling preventing the sale.

If the sale is allowed, Kmart can accept the offer, or reject it. If Kmart rejects the offer, Walmart has a 40 percent chance of making a second offer, and Kmart has a 60 percent chance of coming back first, with its own price offer.

If a second offer is made by either party, there is a 20 percent chance FTC may belatedly prevent the sale. If the second offer is allowed by the FTC, but is rejected anyway by the counterparty, then no one gets anything, and Kmart retains ownership of its stores.

In that last case the FTC stops negotiations for sure because the journalists have well and truly caught on.

You are reminded that this is Walmart screen and that you have to wait for Walmart to make a decision

Walmart writes an offer to Kmart

1. Write an offer to Kmart and click "Continue".
2. Offer has to be greater than 0.

ComLabGames - Client

Description Username: Nora Id: 0 Identity: 1

Round: 1

Walmart

Please write the offer to **Kmart**.

Offer to **Kmart**: and click "Continue"

Note: offer has to be greater than 0.

The very next instant there is a 20 percent chance that the FTC issues a ruling preventing the sale. Otherwise **Kmart** can accept the offer or reject it. If **Kmart** accepts the proposal **you** gain \$150 million minus the amount offered to **Kmart**; **Kmart** gains the amount it receives from **you** minus \$50 million, the value of the stores. If **Kmart** rejects, **you** will have a 40 percent chance of making a second offer, and **Kmart** has a 60 percent chance of coming back first, with its own price offer. If the stores are not sold **Kmart** keeps its \$50 million facility, and neither firm makes or loses anything.

Stage time limit: unlimited Round: 1

Player type: Walmart (1) Please make a move now!

Waiting 1 of 1 subject(s) to proceed the session!

ComLabGames - Client

Description Username: Nora Id: 8 Identity: 1

Round: 1

Walmart

Please write the offer to **Kmart**.

Offer to **Kmart**: and click "Continue"

Note: offer has to be greater than 0.

The very next instant there is a 20 percent chance that the FTC issues a ruling preventing the sale. Otherwise **Kmart** can accept the offer or reject it. If **Kmart** accepts the proposal **you** gain \$150 million minus the amount offered to **Kmart**; **Kmart** gains the amount it receives from **you** minus \$50 million, the value of the stores. If **Kmart** rejects, **you** will have a 40 percent chance of making a second offer, and **Kmart** has a 60 percent chance of coming back first, with its own price offer. If the stores are not sold **Kmart** keeps its \$50 million facility, and neither firm makes or loses anything.

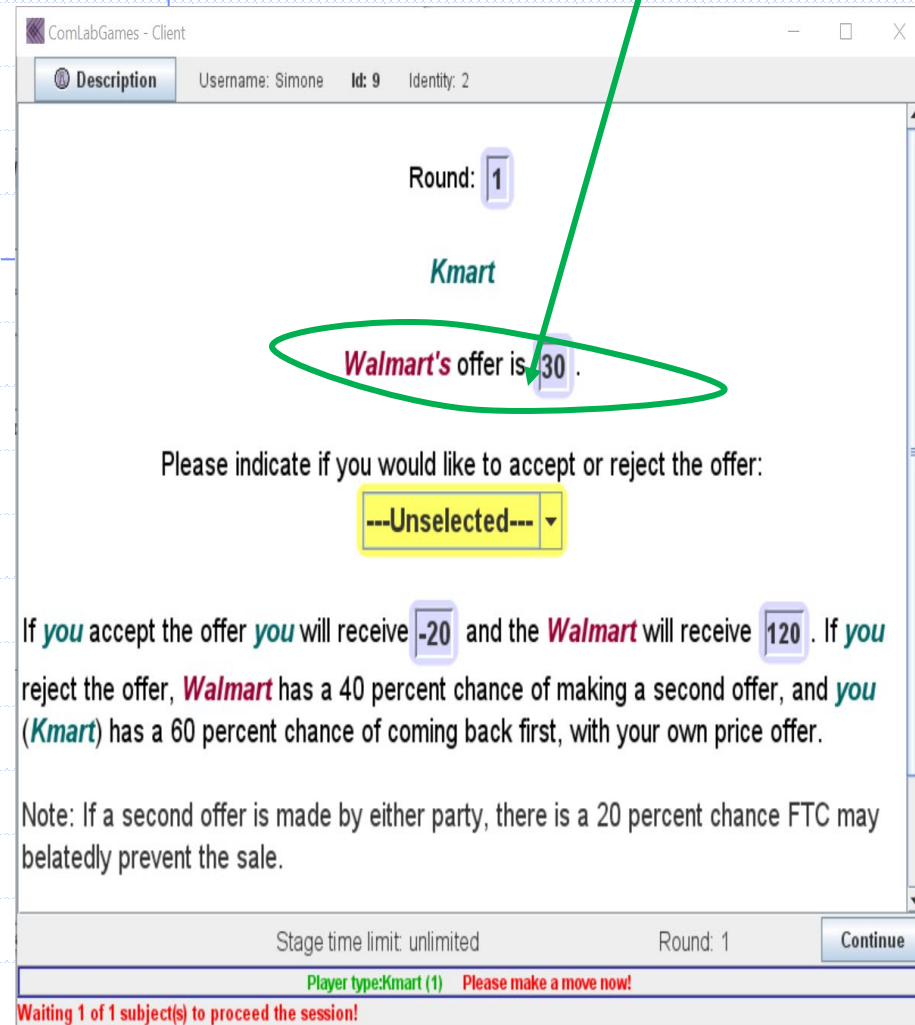
Stage time limit: unlimited Round: 1

Player type: Walmart (1) Please make a move now!

Waiting 1 of 1 subject(s) to proceed the session!

Kmart makes a decision

1. Kmart observes Walmart's offer.
2. Kmart selects to "accept" or "reject" an offer and Click "Continue"



ComLabGames - Client

Description Username: Simone Id: 9 Identity: 2

Round: 1

Kmart

Walmart's offer is 30.

Please indicate if you would like to accept or reject the offer:

---Unselected---

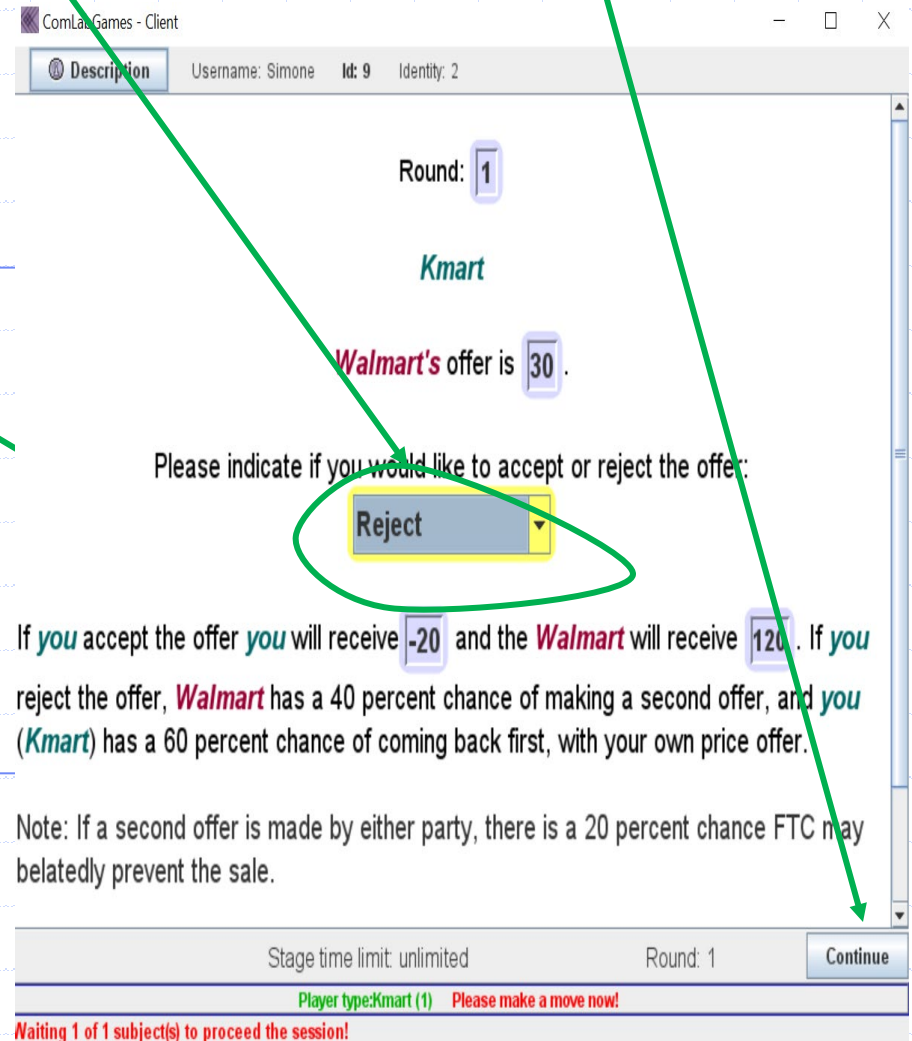
If you accept the offer you will receive -20 and the Walmart will receive 120. If you reject the offer, Walmart has a 40 percent chance of making a second offer, and you (Kmart) has a 60 percent chance of coming back first, with your own price offer.

Note: If a second offer is made by either party, there is a 20 percent chance FTC may belatedly prevent the sale.

Stage time limit: unlimited Round: 1 Continue

Player type:Kmart (1) Please make a move now!

Waiting 1 of 1 subject(s) to proceed the session!



ComLabGames - Client

Description Username: Simone Id: 9 Identity: 2

Round: 1

Kmart

Walmart's offer is 30.

Please indicate if you would like to accept or reject the offer:

Reject

If you accept the offer you will receive -20 and the Walmart will receive 120. If you reject the offer, Walmart has a 40 percent chance of making a second offer, and you (Kmart) has a 60 percent chance of coming back first, with your own price offer.

Note: If a second offer is made by either party, there is a 20 percent chance FTC may belatedly prevent the sale.

Stage time limit: unlimited Round: 1 Continue

Player type:Kmart (1) Please make a move now!

Waiting 1 of 1 subject(s) to proceed the session!

Walmart observes Kmart decision Window

1. Walmart cannot make a decision.
2. Walmart sees the same window as Kmart.

ComLabGames - Client

Description Username: Nora Id: 8 Identity: 1

Walmart: You are not Making a Decision !!!!
This Page is for you to see the information given to Kmart

Round: 1

Kmart

Walmart's offer is 30.

Please indicate if you would like to accept or reject the offer:

---Unselected---

If **you** accept the offer **you** will receive -20 and the **Walmart** will receive 120. If **you** reject the offer, **Walmart** has a 40 percent chance of making a second offer, and **you** (**Kmart**) has a 60 percent chance of coming back first, with your own price offer.

Note: If a second offer is made by either party, there is a 20 percent chance FTC may belatedly prevent the sale.

Stage time limit: Round: 1 Continue

Player type: Walmart (1) Please wait for other players to make their choices!

Waiting 1 of 1 subject(s) to proceed the session!

Kmart makes an offer

1. Kmart writes an offer to Walmart and clicks Continue.
2. Walmart observes the Kmart window and waits for Kmart to make an offer.


The image shows two screenshots of a game interface. The left screenshot shows a player named Simone in Round 2, where Kmart has made an offer of 30. Simone has rejected this offer and is now making their own offer of 35. The right screenshot shows a player named Nora in Round 2, where Kmart has made an offer of 30. Nora has rejected this offer and is now waiting for Kmart to make another offer. A pink oval highlights a red message in the right screenshot: "Walmart: You are not Making a Decision !!!! This Page is for you to see the information given to Kmart".

Left Screenshot (Simone):

ComLabGames - Client
Description Username: Simone Id: 5 Identity: 2

Round: 2

Kmart



You rejected **Walmart's** offer of 30. Please write your own price offer to **Walmart**:

Your price offer:

Note: offer has to be greater than 0.

Note: There is a 20 percent chance FTC may belatedly prevent the sale. If the second offer is allowed by the FTC, and **Walmart** accepts the proposal **you** gain the amount you receive from **Walmart** minus \$50 million, the value of the stores. **Walmart** gains \$150 million minus **your** price offer; If the second offer is allowed by the FTC but is rejected anyway by **Walmart**, then no one gets anything, and **you (Kmart)** retain ownership of the stores.

Stage time limit: unlimited Round: 1 Continue

Player type:Kmart (1) Please make a move now!

Waiting 1 of 1 subject(s) to proceed the session!


Right Screenshot (Nora):

ComLabGames - Client
Description Username: Nora Id: 11 Identity: 1

Walmart: You are not Making a Decision !!!!
This Page is for you to see the information given to Kmart

Round: 2

Kmart



You rejected **Walmart's** offer of 30. Please write your own price offer to **Walmart**:

Your price offer:

Note: offer has to be greater than 0.

Note: There is a 20 percent chance FTC may belatedly prevent the sale. If the second offer is allowed by the FTC, and **Walmart** accepts the proposal **you** gain the amount you receive from **Walmart** minus \$50 million, the value of the stores. **Walmart** gains \$150 million minus **your** price offer; If the second offer is allowed by the FTC but is rejected anyway by **Walmart**, then no one gets anything, and **you (Kmart)** retain ownership of the stores.

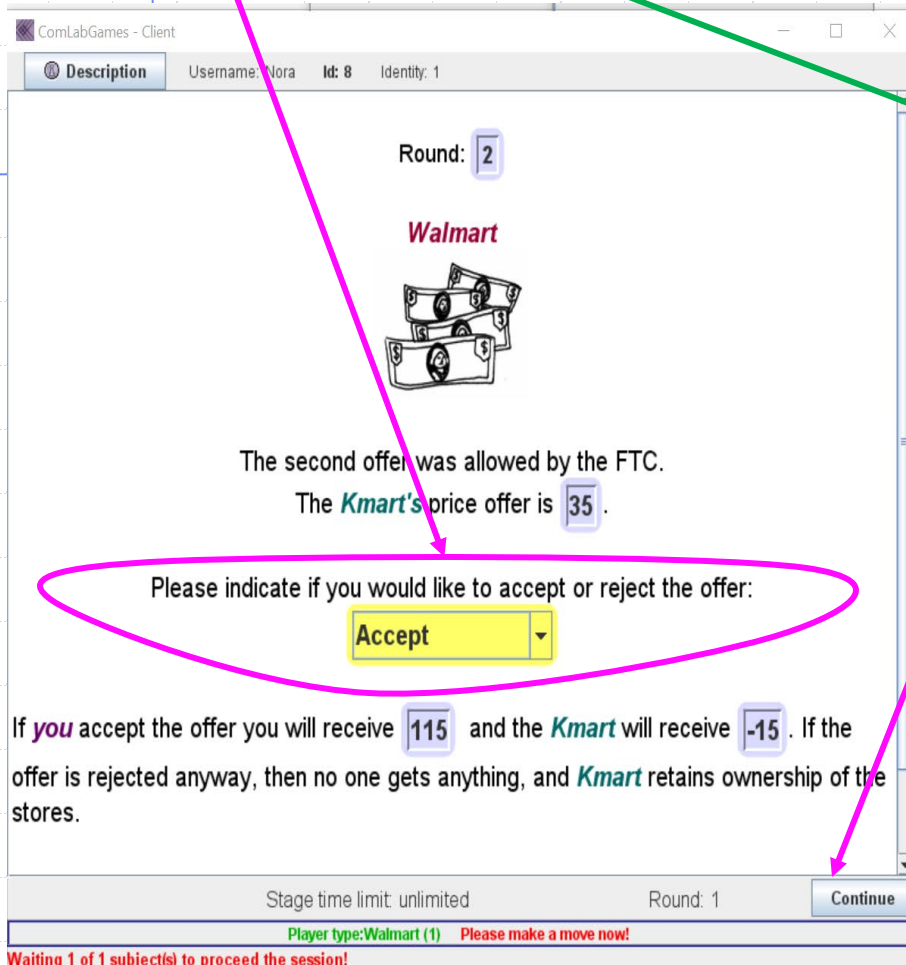
Stage time limit: unlimited Round: 1 Continue

Player type:Walmart (1) Please wait for other players to make their choices!

Waiting 1 of 1 subject(s) to proceed the session!

Walmart makes a decision

1. Walmart makes a decision and clicks "Continue."
2. Kmart sees the same window as Walmart.




ComLabGames - Client

Description Username: Nora Id: 8 Identity: 1

Round: 2

Walmart



The second offer was allowed by the FTC.
The **Kmart's** price offer is 35.

Please indicate if you would like to accept or reject the offer:

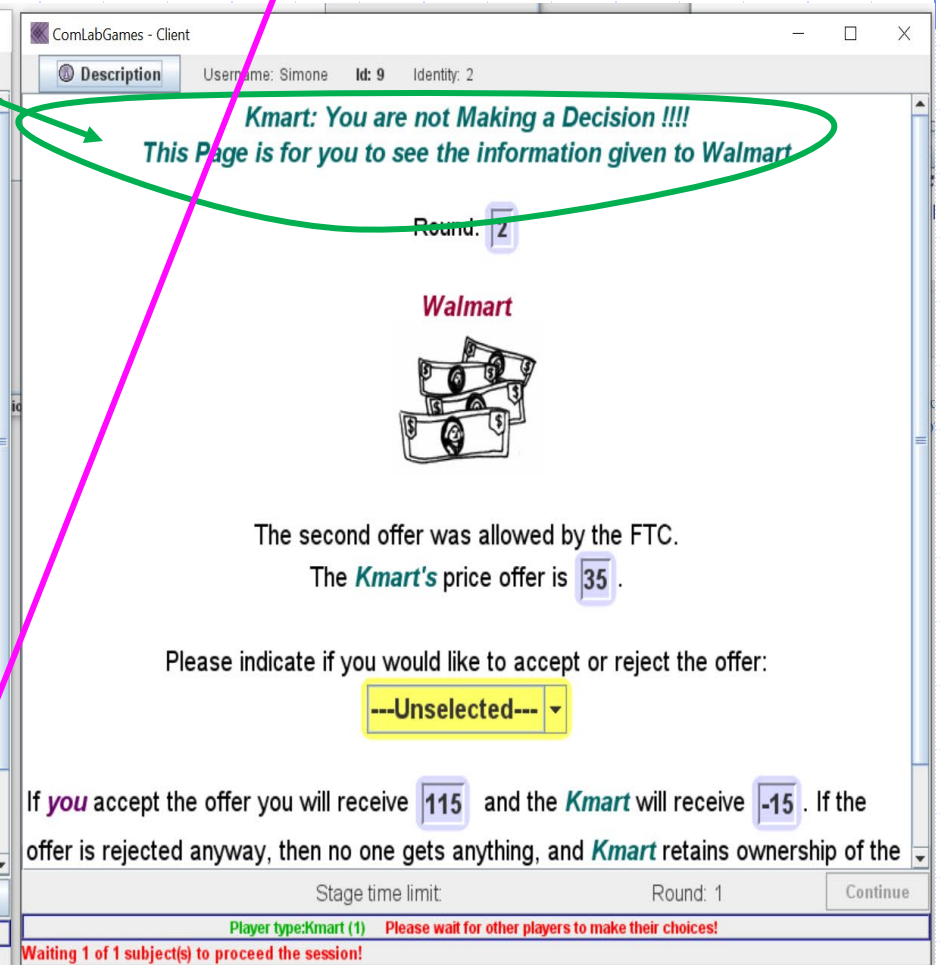
Accept

If **you** accept the offer you will receive 115 and the **Kmart** will receive -15. If the offer is rejected anyway, then no one gets anything, and **Kmart** retains ownership of the stores.

Stage time limit: unlimited Round: 1 Continue

Player type: Walmart (1) Please make a move now!

Waiting 1 of 1 subject(s) to proceed the session!




ComLabGames - Client

Description Username: Simone Id: 9 Identity: 2

Kmart: You are not Making a Decision !!!!
This Page is for you to see the information given to Walmart

Round: 2

Walmart



The second offer was allowed by the FTC.
The **Kmart's** price offer is 35.

Please indicate if you would like to accept or reject the offer:

---Unselected---

If **you** accept the offer you will receive 115 and the **Kmart** will receive -15. If the offer is rejected anyway, then no one gets anything, and **Kmart** retains ownership of the

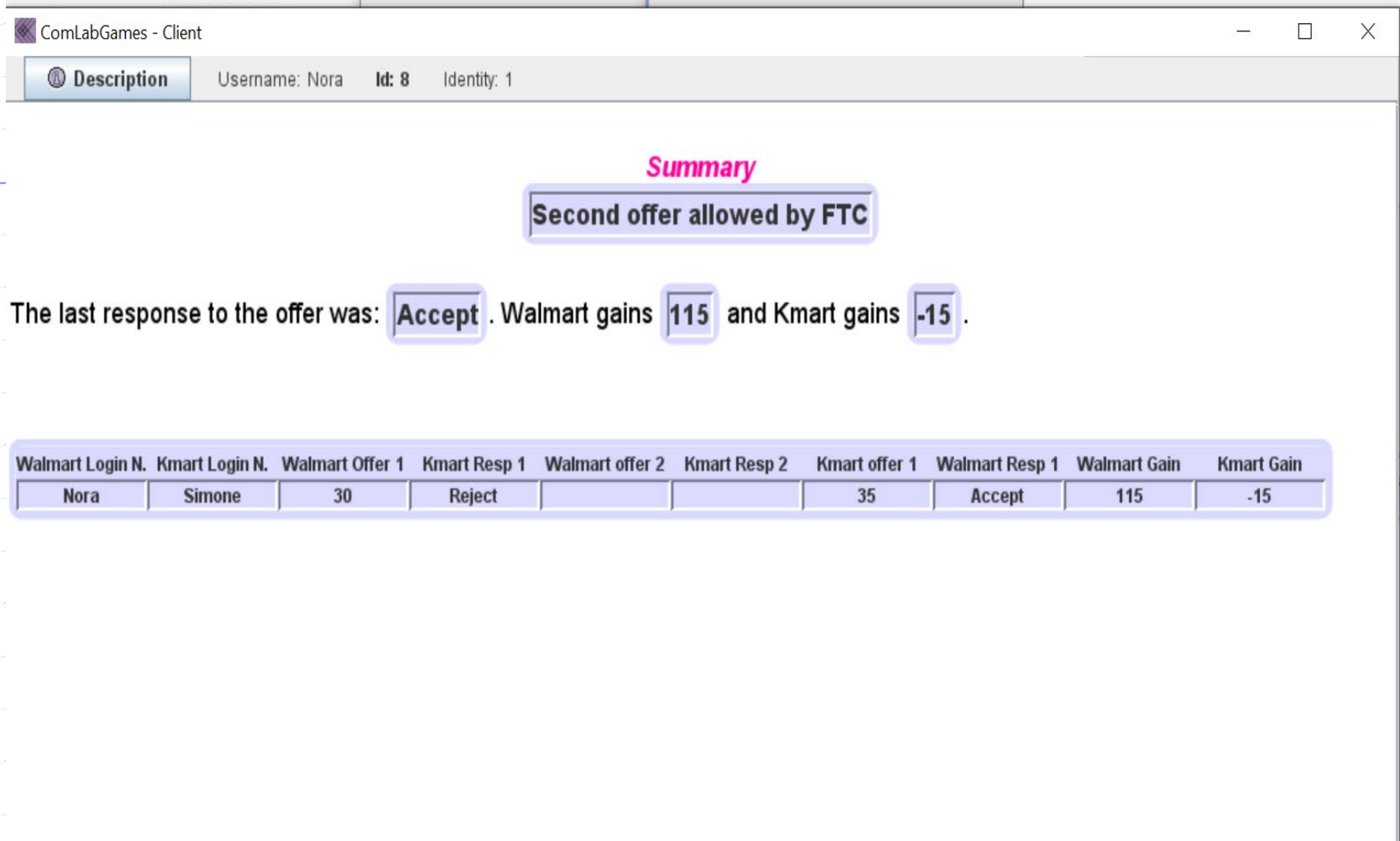
Stage time limit Round: 1 Continue

Player type: Kmart (1) Please wait for other players to make their choices!

Waiting 1 of 1 subject(s) to proceed the session!

Summary of Results

1. Results show the paired subject in a session.
2. Results for the first round and final gains for both subjects.



The screenshot shows a window titled "ComLabGames - Client". The window has a header bar with a "Description" button and text: "Username: Nora Id: 8 Identity: 1". The main content area displays a "Summary" section with the text "Second offer allowed by FTC". Below this, it states "The last response to the offer was: **Accept** . Walmart gains **115** and Kmart gains **-15** .". At the bottom, there is a table with the following data:

Walmart Login N.	Kmart Login N.	Walmart Offer 1	Kmart Resp 1	Walmart offer 2	Kmart Resp 2	Kmart offer 1	Walmart Resp 1	Walmart Gain	Kmart Gain
Nora	Simone	30	Reject			35	Accept	115	-15

WALMART MAKES FIRST BID

20%
THEY BOTH
NET \$0.

WALMART BIDS

$$\$ (50m + 48m) = \$98m$$

AND NETS \$52m

IF KMART ACCEPTS

IF KMART REJECTS
THEN EXP. VAL. TO

- KMART IS $60\% \times \$80m = \$48m.$
- WALMART IS $40\% \times \$80m = \$32m.$

IF KMART REJECTS

60% KMART
MAKES A
SELL OFFER

KMARTS ASKS \$150m.
AT THAT TIME EXP. VAL. IS
 $\$100m \times 80\%$
 $= \$80m$

40% A
WALMART MAKES
A SECOND BID

WALMART BIDS
\$50m. AT
THAT TIME
EXP. VAL. IS
 $\$100m \times 80\%$
 $= \$80m.$

Iterative dominance

- ◆ We solved perfect information games by **successively eliminating** those strategies that do not end with the best choice in the very last step.
- ◆ This is an application of **iterative dominance**.
- ◆ Suppose that a player believes their rival (or more generally another player) is rational, and would :
 - always play a dominant strategy if she has one
 - (more generally) never play a dominated strategy.
- ◆ Then the player should simplify the game by banking on her rival:
 - playing her dominant strategy for sure (if it exists)
 - never playing a dominated strategy.

How sophisticated are the players?

- ◆ Applying **iterative dominance** assumes players are more sophisticated than only applying dominance.
- ◆ The dominance principle is a compelling unilateral strategy.
- ◆ In contrast, a player who follows the principle of iterative dominance does so because s/he believes the other players also choose according to that principle.
- ◆ Each player must recognize all the dominated strategies of every player, reduce the strategy space of every player as called for, and then repeat the process.
- ◆ If all the players think logically about strategic interaction, the principle of iterative dominance is very persuasive.

Summary

◆ This lecture introduced a very powerful principle for strategic play: **dominance**.

◆ It has three parts:

1. Dominant strategies (You should always play these.)
2. Dominated strategies (Never play these.)
3. Iterative dominance (If the other players in the game are moderately sophisticated, simplify the game by exploiting the fact that they are smart.)