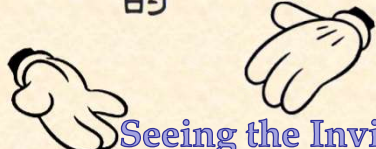


發現 看不見 的



Seeing the Invisible Hand

Game Rules: (規則說明)

- There are 4 rounds (共進行四個回合)
- Each group start with (每組的基本籌碼為) **150 Ecoins**
- You are awarded based on total Ecoins added at the end (遊戲結束後·以手上增加的籌碼總量計分)
- In each round, each group will draw a card; please make sure other groups do not see it. (每組在每回合都會抽取一張撲克牌·請確保別組無法看到這張牌)

Note that Luck is involved here!
(請注意：本活動有一定的機運成分存在)

Game Rules: (規則說明)

- Num on the card is transferred to Ecoins (撲克牌牌面【點數】及其所代表【金額】的對照表)
- 點數(card #)*10 = 金額 (Ecoins)

牌面點數	A	2	3	4	5	6	7	8	9	10	J	Q	K	card
金額	10	20	30	40	50	60	70	80	90	100	110	120	130	Ecoins

Now we shall introduce...


(接下來要特別介紹...)

Your card is black
(抽到黑牌)

Seller
(賣方)

Your card is red
(抽到紅牌)

Buyer
(買方)



Oh, my God!
我的老天爺啊

Your card is black
(抽到黑牌)

Seller
(賣方)

Your card is red
(抽到紅牌)

Buyer
(買方)

Game Rules: (規則說明)

- Seller if card is black (抽到黑牌是賣方)
- Pays \$\$ amount on black card to buy 1 [Product Card] from: (要購入 1 張【商品卡】·可以持手上黑牌以牌面金額找)
- E.g. (例如) ♣5 = 50 Ecoins
- Sells [Product Card] to buyer (可以將【商品卡】賣給買方)



> Seller Profit (賣方利潤) =
Price (成交價格) - Cost (進貨成本)
 > Higher Price (成交價格愈高)
 → Higher Profit (賣方利潤愈多)
 > Price (成交價格) < Cost (進貨成本)
 → Sell at a loss (賣方虧本)
 > No Trade (如果沒有交易)
 → 0 Profit (利潤為零)

Oh, my God!
我的老天爺啊

Product (商品卡)

Seller (賣方) ♣5

Buyer (買方)

Ecoins Price (成交價格)

50 Ecoins

Game Rules: (規則說明)

- > Buyer if card is Red (抽到紅牌是買方)
- > Buy (at most 1) [Product Card] from seller (可以向賣方買【商品卡】(每人限購1張))
- > Earns \$\$ amount on red card if sells [Product Card] to: (可以持手上紅牌以牌面金額將【商品卡】賣給)
- > E.g. (例如) ♦ J = 110 Ecoins

> Seller Profit (賣方利潤) =
Price (成交價格) - Cost (進貨成本)
 > Higher Price (成交價格愈高)
 → Higher Profit (賣方利潤愈多)
 > Price (成交價格) < Cost (進貨成本)
 → Sell at a loss (賣方虧本)
 > No Trade (如果沒有交易)
 → 0 Profit (利潤為零)

> Buyer Gain (買方好處) =
Value (商品價值) - Price (成交價格)
 > Lower Price (成交價格愈低)
 → Higher Gain (買方好處愈多)
 > Price (成交價格) > Value (商品價值)
 → Buy at a loss (買方好處為負)
 > No Trade (如果沒有交易)
 → 0 Gain (好處為零)

Oh, my God!
我的老天爺啊

Product (商品卡)

Seller (賣方) ♣5

Buyer (買方) ♦

Price (成交價格) in Ecoins

50 Ecoins

110 Ecoins

Game Rules: (規則說明)

> E.g. If Jack the ♦ J traded with Fred the ♣5 at price \$78 (舉例來說· 如果持有♦J的小明與持有♣5的小華以78元成交)

> Gains of Jack are (小明得到的好處為)
 $110 - 78 = 32$

> Profits of Fred are (小華的利潤則是)
 $78 - 50 = 28$

Game Rules: (規則說明)

> When a buyer and a seller group reach agreement, bring your cards to OMG to complete the trade (買賣一旦成交· 請雙方一起帶著撲克牌找老天鴉完成交易)

1. Seller buys [Product Card] from OMG at card \$\$ (賣方向老天鴉購買【商品卡】· 支付賣方卡片金額)
2. Buyer buys [Product Card] from seller and write the price it. (買方向賣方購買【商品卡】並在其上寫下「成交價格」)
3. OMG buys [Product Card] from buyer at card \$\$ (老天鴉向買方購回【商品卡】· 支付買方卡片金額)

Game Rules: (規則說明)

1. Trade is voluntary, (買賣均須在自願的前提下進行· 不能強迫)
2. Trade is irrevocable if reported, (申報交易後不能反悔。)
3. Cannot show your card to others. (不可亮牌給別人看。)

Quiz: (小測驗)

- > What if Jack has ♥5 and Fred has ♠K? (若小明抽到♥5· 小華抽到♠K?)
- > What if King has ♣9 and John has ♠2? (若老王抽到♣9· 小強抽到♠2時?)

What is the role of OMG? (你認為老天貓扮演什麼角色呢?)

Bless Our Land!
賜福 人間

Oh, my God!
我的老天貓啊

Product (商品卡) 50 Ecoins
Product (商品卡) 110 Ecoins

Seller (賣方) ♣5
Buyer (買方) ♠1

Price (成交價格) in Ecoins

Each group send one to draw a card
(請每組派一位來找主持人抽一張撲克牌)

Fill out the top of Q1 (填寫學習單第1題的上半部)

Seeing the Invisible Hand (發現看不見的手)

1. Was the card you received red or black? What was the card number and dollar amount? Did you make a trade? Earn or lose money? What was your net profit? 你抽到紅牌還是黑牌? 牌面數字或金額是多少? 買賣有成交嗎? 賺了還是虧了? 淨得多少好處或利潤呢?

Round (回合)	1	2	3	4
Color (牌面顏色)	R(紅)、B(黑)	R(紅)、B(黑)	R(紅)、B(黑)	R(紅)、B(黑)
Num. (牌面數字)	J			
Dollar (牌面金額)	110			

To complete the trade, pairs who reach agreements can bring their cards & \$\$ to OMG
(成交雙方請帶著撲克牌和籌碼找...)

OMG (老天貓)

> Round 1: Free-form bargaining (3min) 第一回合: 自由交易

02 : ■■

01 : ■■

00 : ■■

➤ Return your card if no trade (請沒有成交的各組交回撲克牌)
 ➤ Fill out the bottom of Q1 (請完成學習單第 1 題的下半部)

Seeing the Invisible Hand (發現看不見的手)

1. Was the card you received red or black? What was the card number and dollar amount? Did you make a trade? Earn or lose money? What was your net profit? 你抽到紅牌還是黑牌? 牌面數字或金額是多少? 買賣有成交嗎? 賺了還是虧了? 淨得多少好處或利潤呢?

Round (回合)	1	2	3	4
Color (牌面顏色)	R(紅)、B(黑)	R(紅)、B(黑)	R(紅)、B(黑)	R(紅)、B(黑)
Num. (牌面數字)	J			
Dollar (牌面金額)	110			
Price (成交價格)	78			
Earn/Lose (盈虧)	E(賺)、L(賠)			
Profit (好處/利潤)	32			

Cross if no trade (沒有成交就打X)

Each group send one to draw a card (請每組派一位來找主持人抽一張撲克牌)
 Fill out the top of Q1 (填寫學習單第 1 題的上半部)

Seeing the Invisible Hand (發現看不見的手)

1. Was the card you received red or black? What was the card number and dollar amount? Did you make a trade? Earn or lose money? What was your net profit? 你抽到紅牌還是黑牌? 牌面數字或金額是多少? 買賣有成交嗎? 賺了還是虧了? 淨得多少好處或利潤呢?

Round (回合)	1	2	3	4
Color (牌面顏色)	R(紅)、B(黑)	R(紅)、B(黑)	R(紅)、B(黑)	R(紅)、B(黑)
Num. (牌面數字)				
Dollar (牌面金額)				

To complete the trade, pairs who reach agreements should bring cards & \$\$ to **OMG (老天鵝)**
 (成交雙方請帶著撲克牌和籌碼找...)

➤ Round 1: Free-form bargaining (3min) 第一回合: 自由交易
 ➤ Round 2: Free-form bargaining (3min) 第二回合: 自由交易

02 : ■■

01 : ■■

00 : ■■

➤ Return your card if no trade (請沒有成交的各組交回撲克牌)
 ➤ Fill out the bottom of Q1 (請完成學習單第 1 題的下半部)

Seeing the Invisible Hand (發現看不見的手)

1. Was the card you received red or black? What was the card number and dollar amount? Did you make a trade? Earn or lose money? What was your net profit? 你抽到紅牌還是黑牌? 牌面數字或金額是多少? 買賣有成交嗎? 賺了還是虧了? 淨得多少好處或利潤呢?

Round (回合)	1	2	3	4
Color (牌面顏色)	R(紅)、B(黑)	R(紅)、B(黑)	R(紅)、B(黑)	R(紅)、B(黑)
Num. (牌面數字)				
Dollar (牌面金額)				
Price (成交價格)				
Earn/Lose (盈虧)	E(賺)、L(賠)	E(賺)、L(賠)	E(賺)、L(賠)	E(賺)、L(賠)
Profit (好處/利潤)				

Each group send one to draw a card (請每組派一位來找主持人抽一張撲克牌)
 Fill out the top of Q1 (填寫學習單第 1 題的上半部)

Seeing the Invisible Hand (發現看不見的手)

1. Was the card you received red or black? What was the card number and dollar amount? Did you make a trade? Earn or lose money? What was your net profit? 你抽到紅牌還是黑牌? 牌面數字或金額是多少? 買賣有成交嗎? 賺了還是虧了? 淨得多少好處或利潤呢?

Round (回合)	1	2	3	4
Color (牌面顏色)	R(紅)、B(黑)	R(紅)、B(黑)	R(紅)、B(黑)	R(紅)、B(黑)
Num. (牌面數字)				
Dollar (牌面金額)				

To complete the trade, pairs who reach agreements should bring cards & \$\$ to **OMG (老天鵝)**
 (成交雙方請帶著撲克牌和籌碼找...)

➤ Round 1: Free-form bargaining (3min) 第一回合: 自由交易
 ➤ Round 2: Free-form bargaining (3min) 第二回合: 自由交易
 ➤ Round 3: Open Double Auction (3min) 第三回合: 喊價競標

107 SELL !! 23 BUY ~ TAKE!

02 : ■■

01 : ■■

00 : ■■

➤ Return your card if no trade (請沒有成交的各組交回撲克牌)
 ➤ Fill out the bottom of Q1 (請完成學習單第1題的下半部)

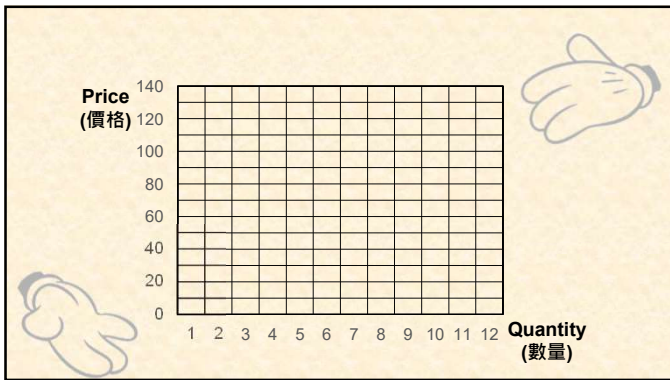
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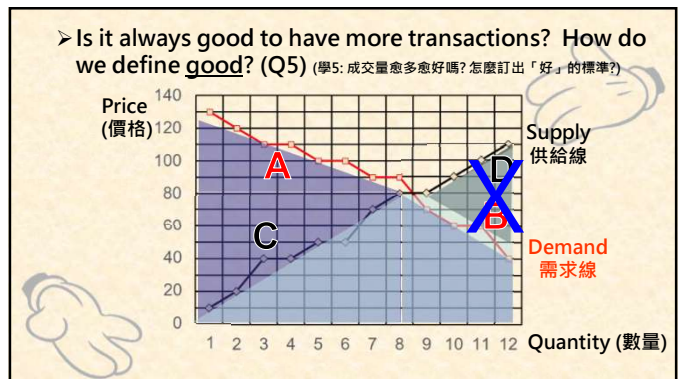
Round (回合)	1	2	3	4
Color (牌面顏色)	R(紅)、B(黑)	R(紅)、B(黑)	R(紅)、B(黑)	R(紅)、B(黑)
Num. (牌面數字)				
Dollar (牌面金額)				
Price (成交價格)				
Earn/Lose (盈虧)	E(賺)、L(賠)	E(賺)、L(賠)	E(賺)、L(賠)	E(賺)、L(賠)
Profit (好處/利潤)				

➤ What is the supply-demand model? (Q2)
 ➤ How is this classroom experiment related to it? (學2: 你聽說過「供需模型」嗎? 這個遊戲跟供需模型有什麼關係?)
 ➤ Review your record in Q1 (請檢視你在學1中關於第一回合的記錄)

Round (回合)	1	2	3	4
Color (牌面顏色)	R(紅)、B(黑)	R(紅)、B(黑)	R(紅)、B(黑)	R(紅)、B(黑)
Num. (牌面數字)				
Dollar (牌面金額)				



➤ How is your reservation price related to the card you received? (Q3)
 (學3: 在找尋交易機會時, 你能夠接受的「價格底限」跟抽到的牌有什麼關係呢?)
 ➤ When the price is \$X, how many buyers and sellers want to trade? (Q3)
 (學3: 當價格被設定在X元時, 買賣雙方各有多少人願意交易呢?)



➤ Is it always good to have more transactions? How do we define good? (Q5) (學5: 成交量愈多愈好嗎? 怎麼訂出「好」的標準?)

When is total blessing maximized? (什麼情況賜福最多?)

Price (價格) vs Quantity (數量)

Supply 供給線

Demand 需求線

➤ Is it always good to have more transactions? How do we define good? (Q5) (學5: 成交量愈多愈好嗎? 怎麼訂出「好」的標準?)

Equality (不愚弄而患不均)

- ✓ Aver. blessing = $(A + B - C - D) \times \frac{1}{24}$
- ✓ (平均每人賜福) (需調查每個人抽到什麼牌, 然後配對)
- ✓ Require knowing everyone's card
- ✓ Will you tell the truth? (會否誠實申報?)

Efficiency (老天鵝最大賜福)

- ✓ Aver. blessing = $(A - C) \times \frac{1}{16} \times \frac{16}{24}$
- ✓ (平均每人賜福)
- ✓ Happens naturally (根據自利原則自然發生)

➤ Calculate the (ideal) total amount of blessing (Q6) (學6: 最大的總賜福量(理想值)是多少?)

Price (價格) vs Quantity (數量)

Supply 供給線

Demand 需求線

490

➤ Calculate Round 1's **actual** total amount of blessing (學6: 請計算第一回合老天鵝**實際**的總賜福量)

➤ $A = 120 + 110 + 110 + 100 + 100 + 90 + 60 = 690$

➤ $B = 10 + 20 + 40 + 40 + 50 + 50 + 80 = 290$

➤ $A - B = 400$, so $400 / 490 = 81.6\%$

➤ What is your card in Round 3? Did you trade? (學1: 第三回合時你抽到什麼牌? 有沒有成交?)

➤ Calculate Round 3's **actual** total amount of blessing (學6: 請計算第三回合老天鵝**實際**的總賜福量)

➤ $A = 130 + 120 + 110 + 100 + 100 + 90 + 90 = 740$

➤ $B = 10 + 20 + 40 + 40 + 50 + 50 + 70 = 280$

➤ $A - B = 460$, so $460 / 490 = 93.9\%$

➤ Does (each) transaction price affect total amount of blessing? (學7: 總賜福量會不會受到(各筆交易的)成交價格所影響? 為什麼?)

Which are affected? (哪些結果會受到影響?)

➤ How does the supply-demand model predict transaction? (學8: 供需理論如何預測成交價格?)

Price (價格) vs Quantity (數量)

Supply 供給線

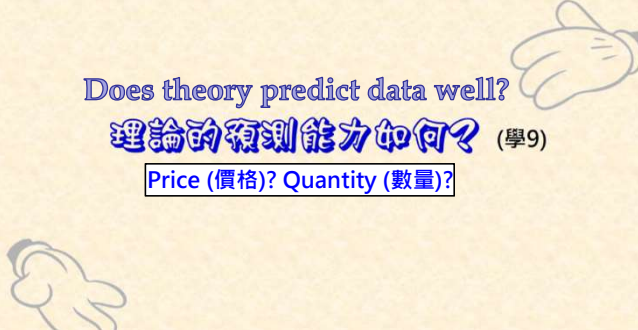
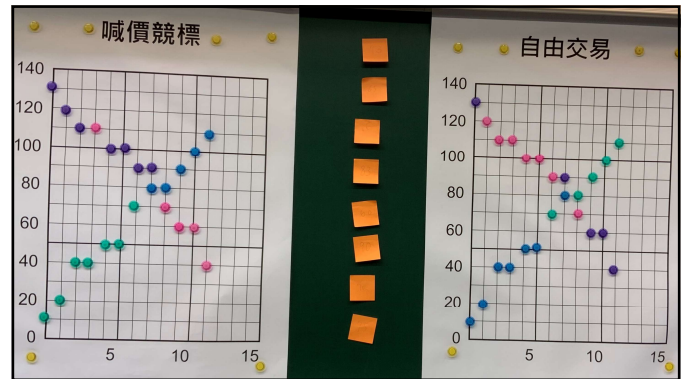
Demand 需求線

Equilibrium Price (均衡價格)

Equilibrium Quantity (均衡數量)

Does theory predict data well?
理論的預測能力如何? (學9)

Price (價格)? Quantity (數量)?

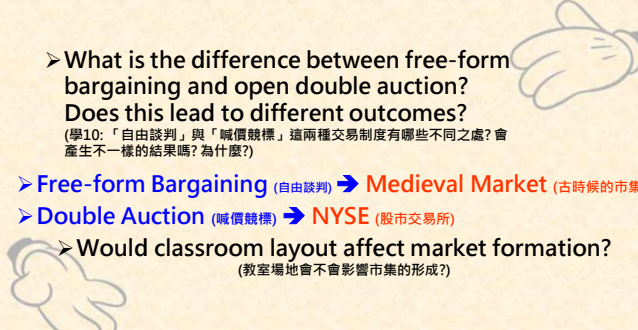



➤ What is the difference between free-form bargaining and open double auction? Does this lead to different outcomes?
(學10: 「自由談判」與「喊價競標」這兩種交易制度有哪些不同之處? 會產生不一樣的結果嗎? 為什麼?)

➤ Free-form Bargaining (自由談判) → Medieval Market (古時候的市集)

➤ Double Auction (喊價競標) → NYSE (股市交易所)

➤ Would classroom layout affect market formation?
(教室場地會不會影響市集的形成?)



The End

(遊戲結束)

Please count your Ecoins
(請結算自己的籌碼)

