

MGEC 621

	Price Leader	Game Theory	Auctions				
Use When	w/ multiple followers		v. Posted P v. Bargained P				
Proce ss	<p>i) determine market supply curve for followers (Q such that $P = MC$)</p> <p>ii) determine how much Q_D is left after followers sell their fill (i.e., "residual Q_D")</p> <p>- residual $Q_D =$ original $Q_D -$ that taken by P takers = original $Q_D - MC$ (sum horizontally)</p> <p>iii) set $MC_{P \text{ leader}} = MR_{P \text{ leader}}$ to maximize π_{leader}</p> <p>iv) Determine Q supplied by followers (given (i) above)</p> <p>v) check – market Q_D should equal market supply</p>	<p><u>Dominant Strategy</u> - both players have optimal choice irrespective of other players act</p> <p><u>Unilateral Dominant</u> One player strategy depends on what other does</p> <p><u>Iterative Dominance</u> i) identify dominated strategies ii) each player chooses assuming no player will choose dominated strategy iii) equilibrium = when only one combo possible given (i+ii)</p> <p><u>MaxiMin</u> – maximize minimum outcome - when unsure other player will act rationally</p> <p><u>Multi equilibria</u> – Nash fails</p> <p><u>Repeated Game</u> (Tit for Tat) - P1 tries to educate P2 - fails when 1st mover advantage exists</p> <p><u>Sequential Games</u> - ??? is there 1st mover</p> <p><u>Threats / Credibility</u> - make game more expensive to play</p>	<p><u>Sealed Bid</u></p> <p><u>Dutch Auction</u></p> <p><u>English Auction</u></p>				
Note	P set by O/P of Dominant firm	Concept of Equilibrium = critical					

				Oligopoly			
	Bundling	Two Part Tariff	Transfer Pricing	P Comp	Collusion	Cournot	Stackleburg
Use When	- multiple products - non-homogeneous Q_D (~ preferences vary b/w customers)	- want more CS - customers have homogeneous Q_D - BUT usable w/ differing Q_D	multi-divisional pricing	- P competition / war - $P = MC$ - each firm grabs MS + ignores competitors	- see inter-dependence - collude to maximize total π of all firms	- simultaneous acts - Q competition (P same for both firms) - firms guess at what others will do - presume all other firms see inter-dependence	- sequential acts - leader m/b identified - no P competition
Procs	<p>i) identify each consumer's reserve P for</p> <p>a) each good <u>and</u></p> <p>b) bundle</p> <p>ii) set up 3 tables (separate + bundled + mixed) showing reserve P and Total π for each combo of reserve P's</p> <p>iii) consider whether buyer will leave mixed bundle (CS + cash value)</p> <p>iv) identify combo providing highest π</p>	<p>A) all consumers = Q_D</p> <p>i) graph CS subject to capture</p> <p>ii) determine MC (derivative of TR + assume $MR = MC$)</p> <p>iii) charge <u>access fee</u> = CS</p> <p>iv) charge <u>usage fee</u> = MC</p> <p>a) if MC curve flat \rightarrow no π</p> <p>b) if MC curve \lt flat \rightarrow π</p> <p>B) consumers Q_D differ</p> <p>i) graph Q_D</p> <p>ii) Trial & Error – try different fees</p> <p>a) usage fee 1st</p> <p>b) access fee</p>	<p>A) Horizontal Divisions</p> <p>i) max π where $MR = MC$ in both plants (but may be at different levels b/c differing costs)</p> <p>B) Vertical Division – No Ext Market</p> <p>i) find MC_{Firm} – vertically sum MC_1 & 2</p> <p>ii) $MC_F = MR_F \rightarrow$ yields Q_F</p> <p>iii) determine P^F using Q^F</p> <p>iv) identify $MC_{Comp Div}$</p> <p>v) plug Q_F into MC_{Comp}</p> <p>vi) $P^I = MC$ of last unit</p> <p>viii) max $\pi_{Prod Div} \rightarrow MR = MC_{DS} + P^I$</p> <p>ix) max $\pi_{Comp Div} \rightarrow MR = MC = P^I$</p> <p>C) Vertical Division –Ext Market</p> <p>i) find $Q_{Prod Div} \rightarrow TR \rightarrow MR = MC$</p> <p>ii) find $\pi_{Prod Div} \rightarrow TR - TC$</p> <p>iii) find $MR_{Comp Div}$</p> <p>iv) find $MC_{Comp Div}$</p> <p>v) max $\pi \rightarrow MR = MC = P^{competitive}$</p>	<p>i) find P in terms of $Q_1 + Q_2$</p> <p>ii) find MC for each firm</p> <p>iii) Set $P = MC_1$ & solve for Q_1 in terms of Q_2</p> <p>iv) Set $P = MC_2$ & solve for Q_2 & solve for Q_2 (\rightarrow substitute Q_1 into MC_2 formula)</p> <p>v) solve for $Q_1 \rightarrow$ substitute Q_2 into formula</p> <p>vi) solve for P \rightarrow subst. Q_1 & Q_2</p> <p>vii) find $\pi \rightarrow TR - TC$</p> <p>viii) answer ??</p>	<p>i) find industry π in terms of $Q_1 + Q_2$</p> <p>ii) max $\pi \rightarrow$</p> <p>a) find MR \rightarrow take partial deriv of (i) for each firm (firms control this)</p> <p>b) solve for Q_1 in terms of Q_2</p> <p>c) solve for Q_2</p> <p>d) find $Q_1 \rightarrow$ substitute Q_2 into Q_1</p> <p>iii) calculate π for each firm $\rightarrow TR - TC$</p> <hr/> <p>i) find $TR_{industry}$ in terms of Q_1 & Q_2</p> <p>ii) find $MR_{industry}$ in terms of Q_1 & $Q_2 \rightarrow$ derive (i)</p> <p>iii) Set $MR_{industry}$ in terms of Q_1 & $Q_2 = MC_1$</p> <p>iv) Find Q_1 (in terms of Q_2)</p> <p>v) Set $MR_{industry}$ in terms of Q_1 & $Q_2 = MC_2$</p> <p>vi) Find Q_2 (in terms of Q_1)</p> <p>vii) Solve for Q_1 (plug Q_2 formula into Q_1)</p> <p>viii) Solve for Q_2 (plug Q_1)</p> <p>ix) find π / answer ??'s</p>	<p>i) Find Firm 1 reaction function</p> <p>a) $TR_1 = P(Q_1 + Q_2) * Q_1$</p> <p>b) MR_1 in terms of Q_2</p> <p>c) $MC \rightarrow$ derive TC</p> <p>d) find $Q_1 \rightarrow MR_1 = MC_1$</p> <p>ii) Calculate Firm 2 reaction function \rightarrow same as (i) above</p> <p>iii) solve for $Q_2 \rightarrow$ substitute Firm 1 reaction function into Firm 2's</p> <p>iv) solve for $Q_1 \rightarrow$ substitute in Q_2</p> <p>v) $P \rightarrow$ in terms of $Q_1 + Q_2$</p> <p>vi) solve for $\pi \rightarrow (TC - TR)$ for both firms</p> <p>vii) answer ??</p>	<p>A) IF Follower Supply Curve given</p> <p>i) find Residual Q_D for Leader \rightarrow horizontally subtract: [Market Demand (Q_D) – Follower Supply (Q_S)]</p> <p>- F Supply – $P = MC$ b/c all are in perfect comp</p> <p>ii) rewrite residual Q_D as $P = ###$</p> <p>iii) find TR_{Leader}</p> <p>iv) find $MR_{Leader} \rightarrow$ deriv of (ii)</p> <p>v) π max Leader $Q \rightarrow MR_{Leader} = MC_{Leader}$</p> <p>vi) solve for P (per Leader info)</p> <hr/> <p>B) Otherwise</p> <p>i) Find P in terms of $Q_1 + Q_2$</p> <p>ii) find $TR_{Follower}$ (in terms of Q_1)</p> <p>iii) Find $MR_{Follower}$ in terms of $Q_1 \rightarrow MR_{Follower} = MC_{Follower}$ (~ reaction function)</p> <p>iv) Find Market Demand Q solely in terms of Leader by substituting reaction funct into Q_D</p> <p>v) Find Leader TR, MR, MC and max $\pi \rightarrow MR = MC$</p> <p>vi) answer ??</p>
Note	- works b/c it does not matter which product in bundle consumer has high reserve P for - Problem – customer may leave bundle (Solution – price bundle \$.01 less)	- goal – capture CS by breaking product P into parts - $CS = \frac{1}{2} Q(b-MC)$?? - selling at MC \rightarrow maximizes CS missed - if different $Q_D \rightarrow$ always maximize π by setting user fee $>$ MC (when considered w/ access fee) - price menu \rightarrow customer reveal Reserve P		oligopoly – small number of seller w/ similar product each firm raises (lowers) output if P is greater (less) than its MC	- firms divide maximized total π so that MC is equal for all - firm w/ lower cost structure will produce more	- reaction function = best reaction to any choice by other firm	substitute firm 2's reaction function into firm 1's π function & take derivative P set by O/P of firm 1 & firm 2 (~ bymarket demand)