

Theories



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2. 1 Theories2. 1. 1 Duopoly Market-Antoine Augustin Cournot (1838)Duopoly theory examines the interaction of two firms in a market which works in producing a homogeneous product. Each firms output and prices are determined by the decisions of the other. Each producer is conscious that his rivals quantity decision will also impact the price he faces and thus his profits.

Consequently, each producer chooses a quantity that maximizes his profits subject to the quantity reactions of his rival.([http://www.economyprofessor.com/theorists/antoineaugustincournot.](http://www.economyprofessor.com/theorists/antoineaugustincournot.php)

php)2. 1. 2 Prisoner??™s Dilemma Game Theory- Merrill Flood and Melvin Dresher (1950)Game theory: the study of how people behave in strategic situations, which mean a situation in which each person, when deciding what actions to take, must consider how others might respond to that action. As the number of firms is small, each firm must act strategically. (Mankiw, et. Al Principles of Economy) A particular important game is called the Prisoner??™s dilemma. The ??? dilemma??? faced by the prisoners here is that, whatever the other does, each is better off confessing than remaining silent. But the outcome obtained when both confess is worse for each than the outcome they would have obtained had both remained silent.

A common view is that the puzzle illustrates a conflict between individual and group rationality, especially in the duopoly market. In duopoly market, each company has an incentive to cheat. Just as self interest drives the prisoners in the prisoners??™ dilemma to confess, self interest makes it

difficult for the duopoly to maintain the cooperative outcome with low production, high prices, and monopoly profit.

http://en.wikipedia.org/wiki/Prisoner%27s_dilemma<http://plato.stanford.edu/entries/prisoner-dilemma/>

In Prisoner's dilemma, there is a matrix of 2 x 2 called "Pay off Matrix". It is a table that shows the payoffs for each player for every possible combination of actions by the players. The game's equilibrium occurs when each player chooses the best possible action given the action of the other player.

This equilibrium concept is called Nash Equilibrium, named after John Nash, 1951 who proposed it. Based on Principle of Economy, A Nash Equilibrium is a situation in which economic actors interacting with one another each choose their best strategy given the strategies the other has chosen. By definition, it is an extension of the concepts of dominant strategy equilibrium and solution for zero-sum games- a situation in which a participants gain or loss is exactly balanced by the losses or gains of the other participants.

3 Developer's Dilemma (Variation of the Prisoner's Dilemma): The developer's Dilemma, which is a simple way to visualize investor a simple way to visualize investor choices when the market is unlikely to sustain rival investments. Explained below is how Developer's Dilemma work: Player 1 can choose between the two row strategies, player 2 between the two column strategies. Outcome of choices (= payoff) for player 1 is listed first.

Player 1/ Player 2	Develop	Don't Develop
Develop	Loss/loss (Market is too small)	Superior profit/ no profit (Dominance of Player 1)
Don't Develop	No profit /superior profit (Dominance of player 2)	No profit/ no

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profit (untapped Market| EXHIBIT I: THE DEVELOPER'S DILEMMAAs shown in Exhibit I, each player has two options, to invest in the development of a new product or not to invest. If only one of the players decides to develop, he will reap superior profits from unchallenged future market dominance. If both players go ahead, the product is likely to generate losses for both players. If neither goes ahead, a profitable market remains untapped. (See Exhibit I.) <http://www.strategy-business.com/article/15872gko=be9cb2>.

2 Relativity and Connectivity2. 2. 1 Duopoly Market, Prisoner's Dilemma, Developer's DilemmaThe consolidation of Mc Donnell Douglas with Boeing and also the exit of Lockheed has left just two major Big players, Boeing and Airbus, to compete on a global basis. Such a duopoly market and competitive industry would involve game-theory modeling, where decisions by one player are dependent on the moves expected of the other player.

The decision on whether to invest or not to invest in a project especially in big industries such as aircraft would be risky undertaking. The risk would also risen when the competitor do the same thing. This is reflected in Boeing cancellation of the development of its 'superjumbo' which aimed to develop aircraft of 500 to 1000 passengers.

The situation begins when Boeing and Airbus plan on developing jetliners with up to 1000 seats. Development of such project would be projected at \$15 billion, with the market demand below 200 aircraft. However, Boeing and Airbus avoided the Developer's Dilemma situation by agreeing on strategic alliance aimed to strengthened resources through the buildup of Very Large Commercial Transport (VLCT) in 1993. By this way, both Boeing

and Airbus look forward on creating profitable solution, and so reducing risk of failing in the market. However, the cooperation was difficult as ??? trust??? is the word they seemed to forget. They accused each other would acquire other??™s crucial technical expertise and afraid of dominance of the other, just as an ordinary would normally face: how to create mutual assurances be credible. Boeing/ Airbus| Develop Superjumbo| Don??™t Develop Superjumbo| Develop Superjumbo| HIGH RISK/ RISK(Boeing loses 400+ monopoly)| RISK/ LOSS (Dominance of Boeing)| Don??™t Develop Superjumbo| LOSS/RISK(Dominance of Airbus)| Profit/Loss(Boeing monopoly on 400+ unchallenged)| EXHIBIT II: THE SUPERJUMBO GAME

Exhibit II above suggest the developer??™s dilemma theory on Boeing and Airbus, on whether to develop or not to develop the super jumbo. The first matrix, indicated by A suggests that if both Boeing and Airbus develop superjumbo, given the information that the market would not ??? willingly accept??? rival products, it will hurt both of them as the risks would be very high.

However, matrix D shows that if both Boeing and Airbus don??™t develop superjumbo , then it would bring advantage to Boeing as its monopoly in the jumbo 400 previously would be unchallenged. Boeing then could go back to its old monopolistic profit on the market of 400 plus. This game theory has shown that Airbus to in any payoff matrix of the game theory should develop superjumbo and so to break down Boeing monopoly in the 400 plus jumbo airlines.

The application on the game theory suggests that entering such market of 400 plus seats would be a risky option, but it would be far riskier for Boeing than for Airbus. Finally, VLCT was dissolved, and Airbus decided to continue

it alone. This resulted in the launch of 550-seat Airbus, called A380 With its ??? superjumbo plane???, A380, Airbus aims for longer trips, more passengers, and planned for fuel conservation through consolidation. While the other hand, Boeing respond to this tense situation through going with another strategy which is developing three models of 787 Dreamliner planes. The three models of Dreamliner are aimed for various market segments. Model 787-3 is designed for large capacity-short distance, while 787-8 and 787-9 is modeled for small capacity-longer distance aircraft. Such situation could be called as Nash equilibrium.

Airbus decision to produce A380 is resulted to compete against Boeing 747. Then, Boeing had also chosen the best strategy to produce 787 Dreamliners due to Airbus launch on Airbus A380. This has shown that both Boeing and Airbus was involved in situation in which each of them choose their best strategy given the strategies the other has chosen (Nash Equilibrium) ([http://www. strategy-business. com/article/15872gko= be9cb](http://www.strategy-business.com/article/15872gko=be9cb)) , ([wikiinvest. com](http://wikiinvest.com))