

## **B6006 MANAGERIAL ECONOMICS**

### **Course Description:**

This is an introductory course in the application of microeconomics to business decision-making that is required of all MBA students (except for those who pass an exemption exam). Although prior experience with economics is neither presumed nor required, many of the students may have studied some of this material during their undergraduate careers. This course covers the broad principles of microeconomics which underlie and/or affect all business decisions. The topics falling under this definition include the logic of decision-making encompassing (1) marginal analysis and (2) the structure of decision problems, (3) the implications of these and other principles of decision-making for the evaluation of a range of market environments (e.g. competitive, monopolistic, monopolistically competitive, and oligopolistic markets) and (4) the logical structure and implications of strategic interactions among firms (i.e. game theory). In each of these areas the emphasis will be on applied business decision-making and, therefore, business case discussions will account for one-third of all classes.

### **Type and Length of Exam:**

Open book, all notes allowed, any non-human aid is allowed. A calculator (or computer) is often helpful. 2-4 hours, depending on length of case.

### **Specific Topics Covered:**

The course description (above) provides an overview of these topics. While the course extends far beyond the topics discussed in a standard microeconomics course, it is based mostly on economic theory that is covered in any standard intermediate microeconomics textbook.

### **Recommended Reading for Review:**

Any intermediate microeconomics textbook. Skip consumer theory and welfare economics.

### **Sample Exam:**

Attached is a case that was used in a previous exam (Cascade Airlines), along with sample questions.

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### **SAMPLE EXEMPTION EXAM**

1. If Cascade establishes a full schedule of Seattle-San Francisco flights, what price should it charge for peak period flights? For near peak flights? For off-peak flights?
2. Should Cascade run off-peak San Francisco flights?
3. Should Cascade lease the available Boeing 727 and establish the San Francisco-Seattle flights?
4. Should Cascade expand beyond its current base? Regionally? Nationally?

## **CASCADE AIRLINES - 1979**

Cascade Airlines was established in 1958 as a passenger and freight carrier serving cities in Washington and Oregon which at that time were ignored by the major scheduled airline carriers. Since 1958, it had prospered, but continued to concentrate on offering low cost flights from its Seattle base to cities in those two states. By 1978, Cascade had revenues of \$51 million and net income of \$4.6 million. In early 1979 after passage of the federal airline deregulation act, Cascade's management began to consider the possibility of expanding to include flights outside its basic service area. Air travel demand was growing rapidly and as a highly efficient (non-union), if simple, operator, Cascade's management felt that there were profitable opportunities to be seized.

### **Cascade Airlines**

Cascade Airlines' fleet of four Boeing 727s offered a full schedule of daily flights connecting Seattle, Spokane, Olympia (all in Washington), Portland, Eugene and Salem (in Oregon). All flights left from Seattle in the morning and returned to Seattle at night. Thus, Cascade had a single maintenance and operations center at Sea-Tac (Seattle-Tacoma) Airport where all its maintenance was done and from which flight operations and reservations were carried out. Cascade's flights were no-frills affairs with on-board ticketing and plane-side baggage checking. In-flight snacks and drinks were sold at cost and flight attendants did double duty as ticketing agents and fare collectors. Fares were deeply discounted from those offered by major carriers (i.e., \$30 for a Seattle-Spokane flight compared to \$60 for the major carriers). However, service quality was significantly below that offered by the majors (e.g. United or American Airlines). Cascade configured its 727s to carry 130 passengers compared to about 110 for the major carriers. And, roughly one in twenty of Cascade's flights had to be cancelled because Cascade had no back-up planes to replace those which developed technical problems (this usually meant a delay of only about 2 hours since Cascade had a relatively dense schedule of flights over its simplified route structure). Thus, Cascade tended to draw a consumer base of vacationers, small businessmen, college students and non-business local travellers rather than the corporate travellers who were the mainstay of the national airlines and its advertising, image and promotions were directed at this market.

Cascade's profitability, despite its discount fare structure, was relatively high by industry standards. Its simple route structure made its reservation and operations planning simple and, therefore, cheap. By concentrating all its operations at Sea-Tac, it enjoyed many of the advantages of large scale operations and the need for management oversight and expense was greatly reduced. Because of its approach to ticketing and baggage handling, Cascade typically had only one to two reservation clerks in Seattle itself. Computer systems, because of the reduced route structure and absence of flight connections, were simple, cheap and reliable. Cascade's maintenance force had been recruited among airplane enthusiasts in the late 1950s and early 1960s and, having

worked only with Boeing 727s, was extremely highly skilled at maintaining these aircraft (hence the relatively low technical problem rate of one-in-twenty which allowed Cascade to survive without back-up aircraft). Moreover, being located in Seattle, with Boeing, reduced parts order times and inventories. Finally, all Cascade employees were non-union and, holding significant amounts of company stock, were unlikely to be unionized in the future. Altogether, therefore, Cascade was regarded within Washington and Oregon as a carrier which promised little, but delivered value for money.

## **The Airline Industry**

The airline industry in the United States immediately following deregulation was dominated by a few large carriers. American, United, Delta, TWA, Pan-Am (following its merger with National), Eastern and Northwest accounted for 87 percent of total passenger revenue miles and had together dominated airline travel since the end of World War II. Before steps toward deregulation were taken, fares were controlled and routes were assigned by the Civil Aeronautics Board (Cascade had escaped this regulation through a loophole in the law). Price competition had, therefore, been largely non-existent and, although two or more airlines were usually authorized to fly each route (e.g. NY to Los Angeles) the impact of unlimited entry was eliminated by route restrictions. Nevertheless, competition did exist along some dimensions. Airlines advertised and promoted themselves aggressively and attempted to develop consumer loyalty with strong images and special programs, the latter often aimed at corporate travellers who flew extensively (and, because their companies typically paid, they were relatively price insensitive). Frequent flyer programs offered business and other high frequency travellers free airline tickets and upgrades from coach to first (or business) class once they had accumulated a specified minimum number of miles of travel on a particular airline. Since such awards tended to accumulate rapidly above the minimum level, these programs tended to attach travellers to airlines on which they had accumulated the most miles travelled. Scheduling competition was also intense. Studies of passenger behavior indicated that an airline which had the greatest number of flights between two cities typically captured a disproportionately large share of passenger traffic between those cities. For example, Eastern with 43 percent of NY to Miami flights carried 62 percent of NY to Miami passengers (its next largest competitor PanAmerican had 28 percent of the flights and 26 percent of passenger traffic), since passengers, familiar with the convenience of Eastern's many flights, tended to call Eastern first in making NY to Miami reservations. As a result, carriers offered very frequent flights on many competitive routes, despite the negative effect this had on load factors (the percentage of seats filled on an average flight), in an attempt to dominate the markets in question. Individual airline route structures also tended to concentrate flights, as far as the CAB allowed, in hub airports (like Delta in Atlanta) to and from which they could then dominate all passenger traffic. Computer reservation systems represented a further dimension of competition. These involved huge fixed investments and, consequently, not all airlines developed them. Those (American, United, Delta and Eastern) which did invariably placed their own flights first in any list of scheduled flights, giving themselves first access to potential passengers. Other airlines forced to list their flights with the reservation systems of these four major airlines (for which they paid a

fee) were, therefore, placed at a competitive disadvantage. Finally, airlines competed by offering frills (gourmet meals, free movies, free newspapers, etc.) on top of their basic service.

From the beginning of 1977 until late 1978 when full deregulation took place, the CAB steadily increased the degree of price flexibility allowed to airlines and began rapidly to approve new route requests both by existing airlines and new entrants like Continental, People's Express, NY Air, Texas Air and Air Florida. New fares were generally designed to be usable only by personal not by core business travellers (e.g., they had advance purchase requirements, minimum periods like seven days between return and departure and stayover provisions -- for example, over a Saturday night). However, in some cases, new entrants offered lower fare structures across the board and these had led to aggressive competitive fare-cutting by established airlines. At the same time, established carriers had been relatively successful at maintaining existing fares on routes without new entrants.

Airline costs consisted first of those related to infrastructure; reservations systems, aircraft depreciation and interest including that of reserve aircraft to replace those which could not be flown due to technical problems, ground crews, ground and maintenance facilities and general management overhead. These factors accounted for 50-60 percent of airline costs. They increased with the complexity and extent of an airline's route structure and the size of its fleet. For airlines with comparable route structures, these costs increased less than proportionality with fleet size (number of aircraft); a doubling of fleet size would typically increase infrastructure costs by only 50 percent. A second category of costs were flight related. These included fuel, crew cost, gate fees and landing fees and accounted for about 40 percent of airline cost. They increased proportionately with number of flights that an airline scheduled and less than proportionately with average flight length. Finally, direct passenger related costs which varied proportionately with the number of passengers carried accounted for 5-10 percent of costs and included reservation fees, ticketing costs, lost baggage costs and in-flight meals (for no frills airlines like Cascade and other regionals - Air California, SouthWest Airlines and People Express -- these passenger related costs were negligible). A final cost consideration was that, while the major national airlines operated with union labor, local (e.g., Air Florida, Cascade), regional (e.g., Allegheny) and new airlines (e.g., People Express) were non-union which provided a cost advantage, other things being equal, of 10-15 percent. Information on airline competitors is summarized in Exhibit 1.

## **The San Francisco Route**

The immediate decision confronting Cascade's management was whether or not to extend service to San Francisco and, if so, how many flights to offer and how much to charge. A Boeing 727 had recently become available for lease for two years. Annual lease payments would be \$3.2 million. If Cascade leased the 727, it would take advantage of a gate slot that had recently become available at San Francisco International Airport to initiate service from Seattle to San Francisco. The roundtrip including cleaning, loading

and unloading time at each end would take three hours (of this two hours represented flight time). Starting at 7 AM from Seattle, the single Boeing 727 could provide Seattle-San Francisco flights leaving at 7 AM, 10 AM, 1 PM, 4 PM, 7 PM and 10 PM and San Francisco-Seattle flights leaving 8:30 AM, 11:30 AM, 2:30 PM, 5:30 PM, 8:30 PM and 11:30 PM. Using three aircrews (each consisting of pilot, copilot and four cabin attendant/ticket takers), because FAA regulations specified that no multiple-flight crew be on duty more than nine consecutive hours, Cascade could operate this schedule 300 days per year. The remaining 60 days, including Sundays and holidays would be used to service the aircraft. The costs of operating at this level are described in Exhibit 2.

The new San Francisco service would feature the same no frills approach as Cascade's other services. Including a cancellation rate of 5 percent (in which case ticket prices would be refunded to purchasers), likely passenger volume in the short run (i.e., the two years of the aircraft lease) had been carefully estimated based on consumer surveys. At a price of \$40 each way, Cascade expected to carry an average of 120 passengers per trip for the peak morning and afternoon flights (7 AM, 4 PM from Seattle; 8:30 AM, 5:30 PM from San Francisco). Each \$1 increase (decrease) in price would reduce (increase) the average number of passengers carried by 1.5 per trip at these peak times. Passenger levels would fall to 75 percent of this level for near peak flights (10 AM and 7 PM from Seattle to San Francisco, 11:30 AM and 8:30 PM from San Francisco to Seattle) and to 50 percent of this level for the remaining off-peak flights (These proportional drops in demand would apply at all price levels).

## **General Expansion**

A less immediate but still important question was whether Cascade should seek to take advantage of the opportunities offered by deregulation to expand its route structure and operate as either a national (like American) or large regional carrier (like Allegheny or Piedmont), taking advantage of its simple low cost operating structure and its non-union wage scale to compete with the established carriers. Either using Seattle as a base or establishing a further operations center in San Francisco, Cascade could become a regional airline flying north to Vancouver, south as far as Los Angeles and east as far as Minneapolis (picking up other medium-sized cities along the way). Cascade's strong financial position (no debt and substantial cash reserves) would enable it to purchase a new generation of fuel efficient Boeing 737s and, if it desired, to greatly expand its fleet. Moreover, with the new aircraft Cascade could enter the lucrative market for high fare business travelers.

The argument for expansion was two-fold. First, deregulation meant that strong national airlines like American, United, Delta and NorthWest were developing their own feeder airlines (e.g., American Eagle) in order to bring passengers from smaller cities to their hubs for connections to long distance flights. And, although only a relatively small part of Cascade's business consisted of continuing passengers (about 20%), the major airline feeder services, whose routes would replicate Cascade's, would represent formidable competition and Cascade would have to look elsewhere to replace lost revenues. Second,

the widespread industry view was that deregulation would lead to a major consolidation of the industry as elimination of CAB restrictions on entry lead to intensified competition. If only large full-service airlines were likely to survive, then Cascade had to expand or die. Alternatively Cascade could seek to sell itself or reach some other arrangement with a major airline (like NorthWest which had a hub at SEATAC).

## Exhibit 1

### Airline Competitors

Company	National Market Share (1978)	Fraction of Flights From Cities in Which Carrier is Dominant	Unionized	Return on Capital (1976-78 Average)
<u>National Carriers</u>	(%)	(%)		(%)
American	20.2	44	YES	14.3
United	18.6	33	YES	10.8
Delta	15.1	62	YES	15.8
Eastern	13.6	28	YES	8.7
Pan-Am	10.5	16	YES	5.8
TWA	9.1	16	YES	4.4
NorthWest	3.1	40	YES	12.3
Continental	2.8	12	NO	(3.6)
<u>Regional Carriers</u>				
Allegheny	1.8	28	NO	3.1
Piedmont	1.2	16	YES	(2.6)
<u>Local Carriers</u>				
NY Air	0.9	NA	NO	(4.8)
Air Florida	0.8	NA	NO	5.0
Midway <sup>1</sup>	0.7	NA	NO	8.9
SouthWest Air <sup>2</sup>	0.7	NA	NO	12.9
Air California <sup>3</sup>	0.6	NA	NO	13.6
Cascade	0.3	NA	NO	14.0

<sup>1</sup>NY-Chicago

<sup>2</sup>Houston-Dallas-Austin

<sup>3</sup>San Francisco-San Diego

NA = Not Applicable



## Exhibit 2

### Seattle-San Francisco Operating Costs

Seattle-San Francisco Ground Staff, Facilities	\$105,000/annum
Annual Aircraft Lease	3,200,000/annum
Take-Off, Landing Fees	1,300/round trip
Baggage Handling Fee (San Francisco)	300/round trip
Fuel	2,200/round trip
FAA Mandated Maintenance (parts, special service)	150,000/annum
Hourly Maintenance	200/flight-hour
Air Crews (including benefits)	1,110,000/annum
Aircraft Cleaning	150/roundtrip
Allocated Overhead	1,200,000/annum