THE AIR TRANSPORT INDUSTRY — SOME ECONOMIC ASPECTS

By KNUT HAMMARSKJÖLD*

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The Air Transport Industry Today and its Historical Development.

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1929	212,000,000
1939	2,030,000,000
1949	24,000,000,000
1959	98,000,000,000
1968	308,000,000,000

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700,000 passenger-kilometres. The very rapid expansion in passenger traffic since 1919 is illustrated by Table 1.

The years since World War II brought substantial growth to the air transport industry. From 1948 to 1968 the world's scheduled airlines' passenger traffic increased at an average annual rate of 14.3 percent. The number of scheduled passengers flown increased from 24 million in 1948 to 263 million in 1968. Air freight traffic increased at a faster average annual rate of 15.8 percent between 1948 and 1968, reaching 7,940 million tonne-kilometres in 1968.

International air traffic between countries increased at a faster rate than domestic traffic during the postwar period, and international traffic now accounts for about 42 percent of total passenger-kilometres and 53 percent of freight tonne-kilometres.

The rapid worldwide expansion in air traffic during the postwar period was accompanied by a trend towards larger and faster aircraft with lower operating costs. The largest in current airline service is the McDonnell Douglas DC-8 60 series aircraft, the first high-capacity jet, capable of carrying up to 250 passengers. By the end of 1968 the world's airlines operating fleet numbered 6,771 aircraft in service, of which 2,934 were jets, 1,365 turbo-props and 2,472 piston-engined aircraft.

In 1967, the world's scheduled airlines operating revenues reached a total of $ 12,515 million and their operating expenses $ 11,450 million, leaving an operating profit of $ 1,065 million, but the net profit is only about half that amount. The main sources of airline operating revenues in 1967 were scheduled passenger traffic which accounted for $ 9,719 million and a share of 77.7 percent; cargo revenues with $ 1,188 million and a 9.5 percent share; followed by non-scheduled flights with $ 775 million and a 6.2 percent share. Mail revenues amounted to $ 535 million and a 4.3 percent share; leaving incidental revenues at $ 289 million to account for the remaining 2.3 percent of the total.

Economic Contributions of the Air Transport Industry.

The industry plays an important role in world economic development and, as part of the transportation industry, is basic to the efficient functioning of a progressive economy and its growth potential. In some developing countries air transport has greatly assisted national development, particularly in the absence of other suitable means of transport.

In the course of its growth, the industry has inevitably become more and more closely connected with the general economy where its contribution extends far beyond its role of transporting people and goods.

The air transport industry is important as an employer, providing direct employment for more than 800,000 people and indirect employment for

several millions more. This naturally affects the well-being of the general economy. Airlines are also important purchasers of many services and of many goods other than aircraft. They have, for example, become large customers of the electronics industry, having already invested well over $ 1,000 million on computerizing operations ranging from passenger reservations to inventory control. In leading aviation countries, airline catering has developed into the most important restaurant activity and has become one of the largest customers of food products, wine, spirits, certain paper products, etc.

The importance of air transport to the development of tourism cannot be overemphasized. Travel and tourism now represent the largest single item in international trade, accounting for about 10 percent of the total. International tourism's rate of growth in recent years has been faster than the expansion of the exports of goods of most nations, and about twice the rate of expansion of most GNPs. These trends confirm the growing relative importance of international tourism in the general economy.

Air transport has brought tourism on a large scale to many centres, thereby contributing to the growth of national economies. As shown in Table 2, on the most important international route, the North Atlantic, the number of air travellers increased rapidly during the period 1948-1968, rising from 253,000 in 1948 to 5,752,000 in 1968. At the same time the number of travellers going by sea increased from 501,000 in 1948 to 1,027,000 in 1957, but thereafter experienced a steep decline to 374,000 passengers by 1968, with the result that its share of traffic dropped from 66 percent to about 6 percent of the North Atlantic total.

Table 2. North Atlantic Passenger Traffic Air/Sea 1948-1967
(Passengers in Thousands)

Year	*Air*	*Sea*	*Total*	*Percent by Air*
1948	253	501	754	34 %
1952	448	844	1,332	34 %
1957	1,019	1,027	2,046	50 %
1962	2,587	820	3,407	76 %
1967	5,505	504	6,009	92 %
1968	5,752	374	6,126	94 %

Air travel has made important contributions to the growth of tourism, no doubt influenced by the availability of attractive special excursion and other air fares combined with the ability to travel long distances quickly, thus making shorter visits possible. In terms of fare levels, for instance, the lowest available normal New York-London round trip fare has been reduced substantially from $ 711 in 1951 to $ 420 in 1969. Moreover, under

certain circumstances the round-trip fare between these two cities can be as low as $ 175 for group excursion travel. The offering of attractive air fares has been a most positive contribution by the scheduled airlines to tourist development.

The price of hotel accommodation and of restaurant meals, is a second major factor in the growth of tourism. However, in sharp contrast to reductions in the cost of air travel, these costs have risen rapidly during the past decade. For example a survey of hotel room prices at a sample of 24 major tourist cities throughout the world shows that these have increased by an average of 67 percent between 1958 and 1968 and by 37 percent in the last five years. At the same time restaurant prices at these cities increased by about 80 percent between 1958 and 1968 and about 40 percent between 1963 and 1968. These trends tend to offset the airlines' contribution towards developing tourist travel, despite the growing significance of inclusive tours which benefit from the bulk buying of hotel accommodation and meals.

In view of the anticipated continued rapid growth of tourism, particularly after the further introduction of large high-capacity jets, a worldwide increase in hotel accommodation will be required to develop the full potential of international tourism. This largely explains the current trend for many airlines to invest in hotels and other tourist facilities which represents a further contribution to the development of tourism. Moreover, this also reflects the changing nature of the airline passenger "product" from selling transport to selling travel.

Factors Affecting the Growth of Air Transport.

Air transport is a complex industry and many different and often interrelated factors influence its development. Some of these are basically *external* to the industry, such as general economic and demographic trends, technological advances and government decisions relative to routes and traffic rights. Other factors are mainly *internal,* such as fares and rates, the choice and use of equipment and promotion, as well as the operating conditions proper to each airline.

The demand for air transportation comprises many different markets, but the structure of air passenger demand can be broadly classified into the personal and business travel markets. These two markets reflect certain differences in the effect of socio-economic changes on their growth.

First, the personal travel market depends substantially on the size of the population and certain demographic characteristics including age, education and occupation. Other important factors include the level of disposable and discretionary income, time available for travel, and the cost of travel which can be particularly important. The effect of changes in the cost of travel on the number of people travelling by air, i.e. price elasticity of demand,

varies greatly. One illustration of the influence of cost of travel upon demand can be found in Europe where, according to a recent study, a decrease of 10 percent in the real price of a journey resulted in an increase of 16 percent in the demand for private travel[1], which demonstrates a fairly high price elasticity of demand in this market.

It is also important to recognize that a variety of factors are involved in fare setting. In addition to price elasticity of demand, markets served by air transport differ in size and growth potential. Large increases in traffic are not always dependent upon fare reductions. Furthermore, when demand is somewhat inelastic, fare or rate reductions may not stimulate demand sufficiently to produce enough additional revenue, which can mean significant losses for the airlines.

Second, the business travel market depends largely on factors such as the growth in national economies and structural changes within the economies and the volume of countries' regional and international trade and technical exchanges. As compared with a generally elastic personal demand for air travel in response to changes in the cost of travel, the demand for business travel is less affected by variations in price than by differences in travel time.

A number of other factors are important in the choice of air transportation for both personal and business travel, but their impact on the growth of the two markets is generally more difficult to quantify. These variables include: the availability and cost of alternative modes of travel such as railroads, buses and private automobiles, the availability and frequency of air service, convenience of arrival and departure, speed, comfort, safety, and trip distance.

The air freight market is also basically a function of both the growth and structural changes within national economies, and particularly trade patterns. Some of the other main factors which affect the growth of air freight include the availability and frequency of air services and of competing modes of transport, the speed of service, and particularly freight rates because the demand is generally highly price elastic. One recent study indicates that a 1 percent freight rate reduction results in a 3 percent growth in freight traffic. Another significant factor is the availability of freighter services which can handle large shipments and items that cannot be accommodated in the below-deck holds of passenger aircraft.

Moreover the growing acceptance of the total cost approach in the evaluation of air freight services has given considerable impetus to the growth of air freight traffic. This involves the consideration of such other,

1. *Passenger Air Travel – Characteristics and Forecast of Demand in Europe* (Courbevoie, France: Société d'Etudes Techniques et Economiques, March 1968).

often lower, costs as packing, warehousing, handling and insurance, reductions in interest on capital, lower inventories, and flexibility, which result in more efficient distribution and lower over-all costs.

Some Economic Problems Facing the Industry.

Despite the rapid growth in air transport, the world's scheduled airline industry is faced with an unfavorable financial situation. ICAO figures show that the world industry's 10.6 percent operating profit in 1965 declined to 9.5 percent in 1966 and 8.5 percent in 1967. At the same time the more important net profit figure of 5.8 percent in 1965 was reduced to some 4.5 percent in 1967. From all indications the financial position of the world's airlines was further eroded in 1968.

There are several main reasons for this deterioration in the world's airlines financial position. One of the problems is that costs are rising faster than revenues; indeed rising costs trends have been accentuated. Wages and salaries and the costs of goods and services used by the airlines have risen steadily. In the recent past, the greater productivity and efficiency of the jets over their predecessors enabled the industry generally to overcome inflationary trends. This is now becoming increasingly difficult.

One particular item giving the industry considerable cause for concern is charges levied for airports and air navigation facilities. These have also risen sharply over the years, not only in absolute money terms, but also as a percentage of total airline operating expenses. Worldwide, these costs now amount to more than $ 400 million annually. They have risen from about 3 percent of total airline operating expenses in 1951 to about 5 percent in 1966 and 5.5 percent in 1967. For some airlines they account for as much as 10 percent. As shown in the following chart, airport charges represent one of the fastest, if not the fastest, rising cost item that is eating away a growing percentage of airline revenues.

Recent figures published by the International Civil Aviation Organization (ICAO) indicate that airline landing costs (international and domestic) increased 6.5 times between 1957 and 1967 (Chart 1). In this context it is worth noting that many costs are not under airline control, and some of the trends which they reflect could have serious consequences for the economics of air transport.

The size and number of new aircraft and the type of equipment and facilities required to handle increasing volumes of traffic is involving increasing capital expenditure in aircraft, aircraft equipment and ground facilities. Although the larger jet aircraft generally offer unit cost advantages, they cost more to purchase. For example, current jets such as the DC–8 60 series cost more than $ 10 million and the 747 high-capacity jets cost more than $ 20 million per aircraft. IATA Member airlines alone have 1,000 jet

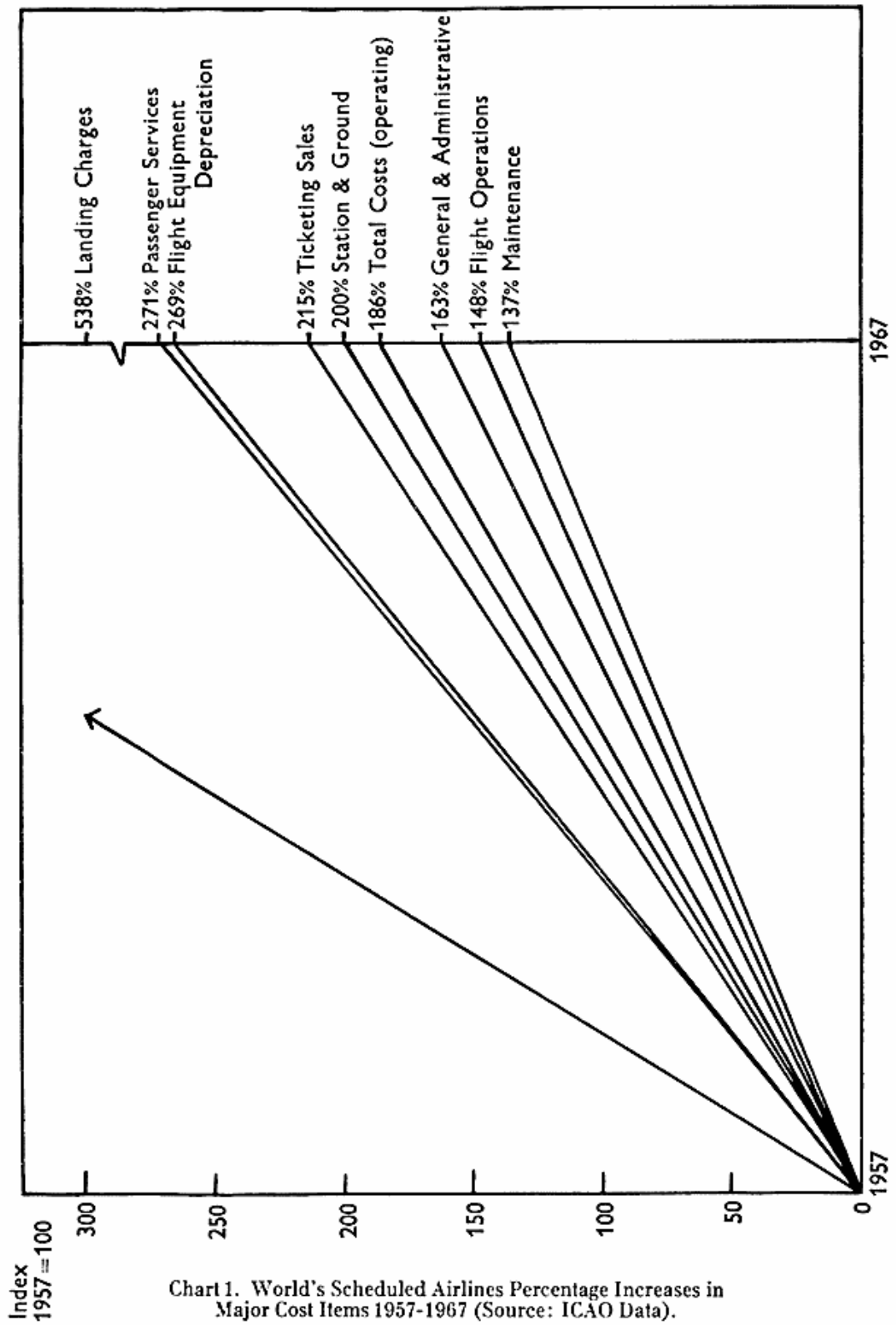

Chart 1. World's Scheduled Airlines Percentage Increases in Major Cost Items 1957-1967 (Source: ICAO Data).

aircraft on order representing a capital investment of approximately $ 15,000 million.

This represents problems of financing which are particularly important in view of the current world-wide general shortage of capital. This shortage reflects the rising demand for capital by the increasingly sophisticated economies of developed countries and capital needs of developing countries to build up their infrastructures. The airline industry can therefore expect some competition for the capital resources required.

Congestion and delays at airports comprise another pressing problem which has come into focus in recent years. The inadequacy of many facilities in coping with current peak traffic volumes has been clearly demonstrated. Needless to say these delays are proving rather costly to the airlines, but increasing attention is being directed at advance planning designed to ensure the provision of adequate facilities and services to meet the demands of future traffic volumes.

No discussion of the economic problems experienced by the air transport industry would be complete without reference to the large seasonal traffic variations which characterize passenger operations particularly, on most routes. Since scheduled airlines are required to provide capacity to handle peak traffic volumes, large seasonal swings in traffic have major economic implications. In the case of freight traffic, strong directional imbalances exist on many routes because freight travels one way only, which makes it difficult to achieve satisfactory profitability.

In general, the very rapid expansion of air freight traffic, mentioned earlier, conceals some of the basic problems faced by airlines operating cargo services. The carriage of cargo is involving increasing capital expenditure in aircraft, aircraft equipment and ground facilities, and heavy investments will be required to handle the considerable future growth forecast for air freight traffic. However, financial justification of such investments is needed, because most all-cargo operations are not profitable at present on an industry basis. It is anticipated that the increased use of large standard size containers and pallets, and of electronic data processing equipment, will assist in reducing ground handling costs and, combined with other action taken, will improve the profitability of air freight services.

Prospects for the Future.

From an airline industry point of view any assumptions about the future should take into account the important determining factors of demand for air transportation. It was indicated earlier that two important determining factors are the growth and characteristics of the world population and a

stable expanding world economy, but it must be recognized that other important and new factors might influence demand for air transportation.

According to United Nations population projections, the world's population will grow faster in the future than it has in the postwar period. It is projected to reach 4,330 million in 1980 compared with 3,295 million in 1965. Similarly the population of ICAO Member States[1] is forecast to grow rapidly and to reach about 3,116 million in 1980 compared with 2,327 million in 1965, as shown in Table 3. Equally important from an air transport point of view are the trends towards improved educational levels, more leisure time, higher average standards of living and increased urbanization, which are expected to continue.

Table 3. World Population 1960 and 1980 (Number Millions).

Region	Population 1960	Population 1980	Average Annual Percentage Increase 1960—1980
World Total	2,998	4,330	1.9
More Developed Regions	977	1,194	1.0
Europe	425	480	.6
USSR	214	277	1.3
Northern America	199	262	1.4
Japan	93	111	.9
Temperate South America	33	46	1.7
Australia and New Zealand	12.7	17.7	1.7
Less Developed Regions	2,021	3,136	2.2
South Asia	865	1,420	2.5
East Asia, excluding Japan	701	930	1.4
Africa	273	449	2.5
Latin America, excluding Temperate South America	179	332	3.1
Melanesia, Polynesia and Micronesia	3	4.8	2.4

Source: World Population Prospects, United Nations

As for the world economic outlook, the long-run expectations are for a relatively high and stable rate of economic growth. For example, through the Organisation for Economic Cooperation and Development the nations of the industrialized West have established definite goals that represent rapid economic growth. In fact almost all countries are committed to achieving high rates of economic growth. And strong efforts in developing countries to close the gap between rich and poor could give a significant boost to economic development in these countries. For example, a recent UN study

1. Contracting States of the International Civil Aviation Organization; Major Exclusions USSR and Peoples' Republic of China.

visualized an acceleration in the average annual rate of real economic growth of developing countries as a group up to 1980. Rapid growth in the world economy would be accompanied by corresponding increases in average consumer disposable and discretionary incomes, which should result in increased demand for air travel.

This is a background against which we can look ahead to probable future passenger traffic development. Recent forecasts indicate that the 1968 world scheduled passenger total of 263 million should reach about 580 million passengers in 1975 and about 770 million in 1980. Even more rapid passenger traffic growth is forecast for certain international routes, notably the North Atlantic and Pacific. Chart 2 illustrates certain forecast increases in passenger traffic from 1967 to 1980.

Air freight should also benefit from the anticipated rapid growth rate of the world's economy and trade. The success of the Kennedy Round in reducing trade barriers will certainly encourage future trade expansion. Particularly rapid growth is forecast in the trade of highly manufactured products because of the long-term trend towards international specialization, which should give air freight an important impetus. Moreover the potential for expansion in air freight appears considerable in view of its present small share of the world freight traffic total.

Indeed this potential is reflected in the fact that air freight is still expected to develop at a much faster rate than passenger traffic. The 1968 freight traffic total of 7,940 million tonne-kilometres is forecast to increase more than three times by 1975, and more than eight times by 1980, as is indicated in Chart 3.

In order to provide the necessary capacity to handle the greatly increased traffic volumes forecast, the world's airlines are planning considerable fleet expansion with jet aircraft. As indicated in Chart 4, by 1975 their total fleet is expected to increase to 7,500 aircraft and by 1980 to 8,500 of which jets will account for some 7,000 aircraft, or more than 80 percent of the total. However, jets should by then be producing close to 100 percent of the scheduled capacity offered.

Several new aircraft types will enter airline service during the next ten years. The first will be the introduction of the high-capacity Boeing 747 jets by the end of 1969. This aircraft will have about two and a-half times the productive capacity of today's 707's. This will be followed by the introduction of the medium-range high-capacity Lockheed 1011 and McDonnell Douglas DC-10 airbuses. Several versions of other new short or medium range high-capacity aircraft are also expected to enter airline service in the 1970's. From an economic point of view, the high-capacity jets not only have a much greater productive capacity, but can also offer lower aircraft direct unit operating costs.

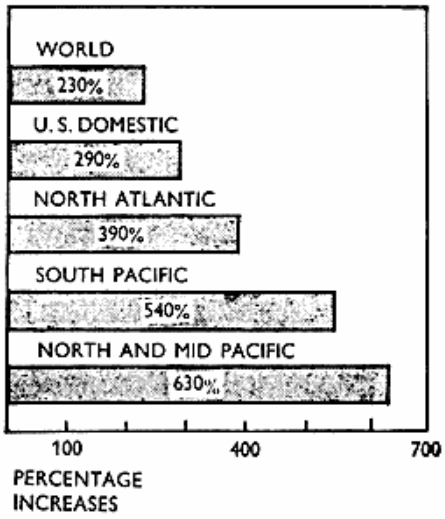

Chart 2. Forecast Total Percentage Increases In Passenger Traffic 1967-1980.

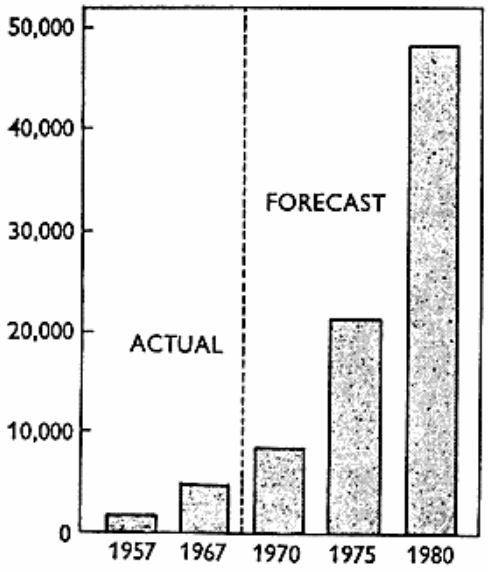

Chart 3. World Air Freight 1957-1980. (Ton - Miles - Millions).

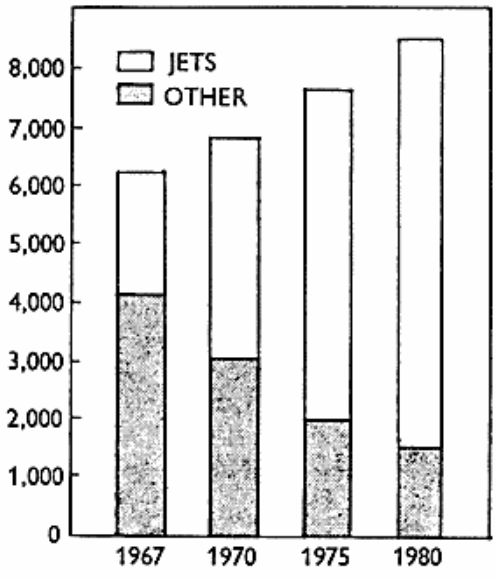

Chart 4. World Airlines Operating Fleet 1967-1980.

The forecasts relate to the world's scheduled airlines (registered in ICAO Contracting States) and represent a consensus of various available forecasts.

The second stage will be the introduction into commercial operation of the supersonic transport which represents a significant technological step forward in civil aviation. Although there is some uncertainty as to the entry of the SST into airline service, the Concorde will be delivered by about 1973 and the much larger US SST probably about four to five years later. Although the economics of these aircraft are still not what the airlines would like, the speed of the SST will be some two to three times greater than that of present day jets. To the extent that business and non-business travellers place value on their time, and this assumption is supported by the experience of the airlines with the introduction of jet aircraft into service during the years after 1958, the introduction of supersonic aircraft into service should produce an increase in air travel. However, the stimulative effect of the SST on traffic growth will be smaller than that of the first jets because of the expected introduction of a supersonic fare differential.

These trends should provide a favorable setting for future development. However, there are several challenging problems that must be overcome to ensure that the industry develops on a sound economic basis.

If the current worldwide tendency towards rising costs, particularly rapidly rising airport charges, persists while airline unit revenue yields continue to decline (with reductions in fares and rates), such trends will contribute to the weakening in the financial position of the air transport industry and will make the sound development and the provision of efficient service to the public more difficult.

The preceding discussion noted both the profitability squeeze faced by the industry and the airlines' need to obtain large amounts of capital to finance present and future purchases of increasingly expensive new aircraft and equipment. Although the industry is expected to be able to obtain the large amounts of capital needed, certain financing problems will probably be faced by some airlines, both privately and government-owned, particularly if the current worldwide capital shortage continues. Furthermore, unless airlines can operate with a reasonable profit margin, these problems will be intensified. Certain difficulties in securing the necessary foreign exhange, notably dollars, will also be encountered.

It is particularly significant in the context of the preceding discussion, indicating the worldwide nature and role of air transport, that governments should pay more attention to the economic contribution and position of the industry than they have accorded to it in the past.

There is a need for policy-making which is guided by an analysis of the economic implications of, for instance, changes in user charges, and by long-run considerations such as the over-all economic value and contribution of air transport in the achievement of economic goals. There is also a need for better consultation between government authorities and airlines, and

between the various agencies responsible for aviation. Since airlines are a utility providing transport as part of the whole transportation industry, they should be considered as components of the infrastructure for economic growth and development in the formulation of government policy.

Attention was drawn earlier to the changing nature of the airline passenger "product" from transport to travel. This shift and further important changes which seem likely, suggest that factors such as the airlines' ability to offer lower fares and efficient services, and the availability of hotel accommodation will be much more important in the development of air transport over the next decade than in the last.

Furthermore, as suggested earlier, a combination of many factors is required for the long-term growth of the transport industry on a satisfactory economic basis. Some of the problems faced by the airlines clearly indicate a need for adequate long-range planning. Moreover, all facets of this industry – airports, governments, airlines and manufacturers – will have to work together on problems affecting all of the inter-related sectors of the transportation industry to ensure the efficient economic development of civil air transport to serve the world's public.

Efforts in this direction should create an environment in which air transport can meet the technological and economic challenges ahead, and continue to provide, through its growth, a valuable public service and an outstanding contribution to the general economy.