

The Future of Business Air Travel

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Recent data indicate that business travel is slowing, and most business travelers are aggressively pursuing travel management policies that include limits on travel and negotiations with airlines for lower fares. Some analysts find that business air travel may be further adversely affected from the proliferation of communications technologies, including teleconferencing. Four findings are discussed: Statistically significant changes in the relationship of business air travel to gross domestic product (GDP) occurred in the late 1980s; recovery of business travel is likely to be less robust compared with previous business cycles. Econometric analysis of business and total passenger enplanements in the U.S. domestic air system indicate that a significant decline in the elasticity of demand with respect to GDP occurred in the late 1980s and early 1990s. About 40 industrial sectors account for 80 percent of business air travel. Median job and output growth for many of these sectors are below the national average. Many companies now turn to travel managers or travel service organizations and third-party firms to manage travel. Business air travelers are no longer willing to pay substantially higher air fares than personal travelers pay and have the skills to counter the airlines' yield management programs. Most industries are familiar with telecommunications technologies and anecdotal evidence indicates many companies are currently substituting teleconferences for travel, at least for intracompany meetings. Future advances in telecommunications and electronic communications offer additional convenient and less expensive alternatives to air travel.

During the 1970s and 1980s, business travel growth was an important component of airline industry profitability and performance. Business travel was the mainstay of the industry, providing sufficient yields to more than cover costs and enabling airlines to offer substantial discounts to personal travelers. Recent data indicate that business travel may no longer be growing, and more business travelers are taking advantage of discount fares. For example, in 1981, discount revenue passenger miles (RPMs) accounted for 70 percent of the total; by 1991, this percentage had risen to over 95 percent (1). Several reasons for the change in business travel have been suggested, including:

- Teleconferencing is beginning to take off. One expert predicts that telecommunications will substitute for 25 percent of business travel by 2010 (2). Another survey indicates a small percentage of business air travel has already been diverted to telecommunications (3).
- Businesses recognize that air travel costs are substantial and take steps to control these costs through use of travel management policies. Many companies are imposing policies that lower fares and impose travel restrictions.
- Corporate downsizing, especially middle managers, likely will result in fewer business travelers.

To help understand the extent to which the above and other factors are influencing business travel, this study attempts to answer the following questions:

1. Has there been a downward shift in the elasticity of demand for air travel with respect to gross domestic product?
2. Which industrial sectors are the major purchasers of business air travel, and what is likely to be happening to their growth and employment profile over the next several years?
3. Are travel management policies changing corporate air travel?
4. How will teleconferencing and other communications technologies affect business travel?

This report is limited to evaluating U.S. *domestic* passenger enplanements, and relies heavily on secondary data from the U.S. Department of Transportation, Federal Aviation Administration (FAA) (4), U.S. Department of Commerce, Bureau of Economic Analysis (BEA) (5), and the U.S. Department of Labor, Bureau of Labor Statistics (BLS) (6).

THE ELASTICITY OF DEMAND FOR AIR TRAVEL

Historically, most analysts found the elasticity of demand for business travel to be inelastic with respect to yields (or fares) and elastic with respect to an income variable, most commonly real gross domestic product (GDP). Since 1988, growth rates in total enplanements have slowed. Figure 1 shows the actual growth in total passenger enplanements compared with the predicted growth using a regression equation based on 1969–1987 data (4). The gap that starts in 1988 reaches about 10 percent by 1993 and declines to about 6% in 1994. (If log linear equations are used, the difference between forecast and actual is over 20%.) Most of the 1994 growth in enplanements, however, was accounted for by short haul trips and discount fares. Data from passenger surveys (3) suggest that business enplanements as a percentage of total enplanements declined about 5 percentage points over the late 1980s and early 1990s.

To test the hypothesis that the relationship between business air travel and GDP has changed, we conducted an econometric analysis using the regression equations shown in Table 1. From 1988 onward, a dummy variable is used. If this variable is significantly different from zero (a *t* static greater than 1.8 at the 95 percent significance level), the hypothesis of a change in the relationship is not rejected. For both the linear and log-linear models, the dummy variable is significant, indicating that such a change in the business air travel elasticity of demand has occurred.

Time series data for more years are available for total passenger enplanements. Additional tests are made using these data, and they also support the hypothesis that significant changes in the demand elasticity relationships occurred at the end of the 1980s. Table 2 presents the estimation results for linear and log-linear models that com-

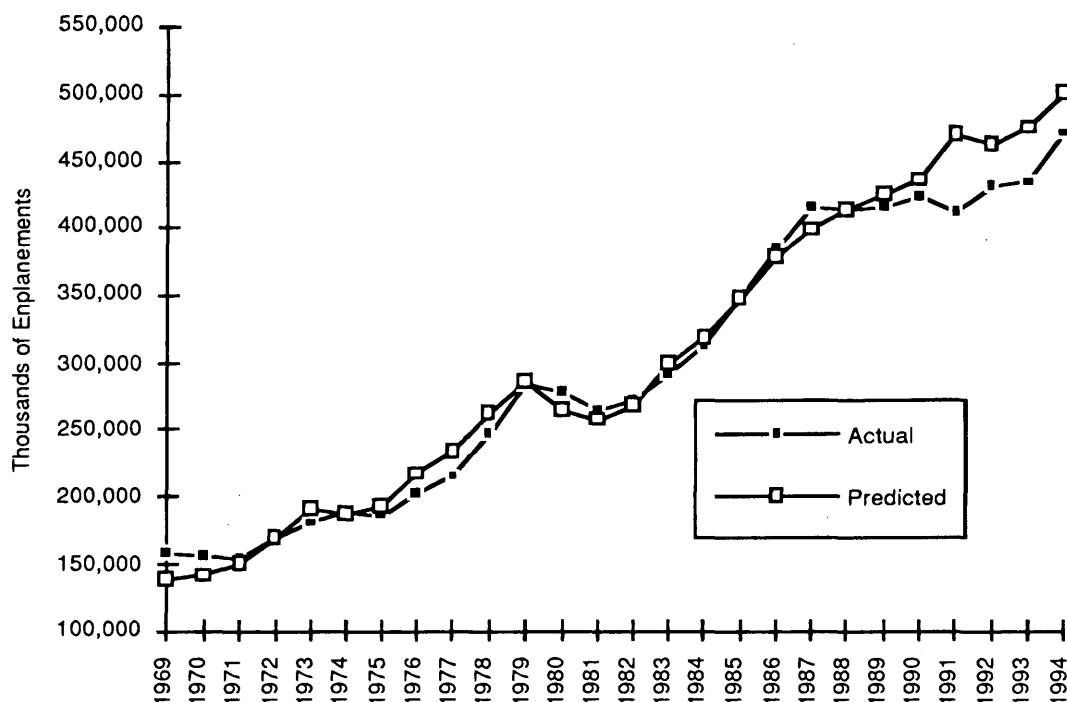


FIGURE 1 Actual versus predicted total domestic passenger enplanements: 1969–1994.

pare the 1969–1987 period to the 1988–1994 period. A test to determine if the coefficients are significantly different (7) is conducted for both models. The results, summarized in Table 3, indicate a difference in coefficients at the 95 percent level for both the linear and log-linear models, and a difference in coefficients at the 99 percent level for the log-linear model. We also tested the hypothesis using dummy variables for the 1988–1994 period. For both the linear and log-linear models, the dummy variables are significant at the 95 percent level, and at the 99 percent level for the log-linear model.

Econometric analysis definitely supports the contention that a major change has occurred in the functional relationship between business travel and traditional explanatory variables, GDP, and yield. This shift indicates that business enplanements, while continuing to grow with the economy, will be growing at a rate lower than that of GDP or similar variable.

Preliminary data are uncertain about the change in passenger enplanements in 1994. Surveys of business travelers suggest business travel will be up, but often travel budgets are the same or lower. Many companies report that they will be increasing the number of airline trips but spending less on air fares because they have implemented cost control and travel management policies (8).

INDUSTRY SPECIFIC ANALYSIS

Major Purchasers of Air Transportation

As shown in Figure 2, the manufacturing industries account for less than 20 percent of business air travel expenditures. Federal, state,

TABLE 1 Estimated Elasticities of Demand for Business Air Travel, 1977–1992

Equation	R ²	F-Statistic	GDP Elasticity	Yield Elasticity	Dummy Variable†
Linear	.985	99.78	1.53 (6.4)	-0.13 (-1.1)	-276.26 (-2.0)
Log Linear	.982	79.16	1.65 (6.0)	-0.18 (-0.9)	-0.07 (-2.0)

† Set equal to zero for years 1977 to 1988, and equal to 1 for 1989 to 1992.

Note: t-statistics given in parenthesis.

TABLE 2 Estimated Elasticities of Demand for Total Air Travel, 1969–1994

Time Period	Adjusted R2	F Statistic	GDP Elasticity	Yield Elasticity	Dummy Variable†
Linear Equations					
1988–1994	0.41	3.06	0.61 (1.12)	-0.21 (-0.50)	
1969–1987	0.98	384.76	1.25 (8.18)	-0.32 (-2.99)	
1969–1994	0.98	648.83	1.03 (6.66)	-0.39 (-3.07)	
1969–1994	0.98	450.87	1.19 (6.92)	-0.34 (-2.80)	-20,097 (-1.79)
Log-Linear Equations					
1988–1994	0.40	3.04	0.58 (1.03)	-0.23 (-0.59)	
1969–1987	0.98	559.33	1.87 (12.83)	-0.41 (-2.47)	
1969–1994	0.97	451.49	1.76 (8.32)	-0.19 (-0.78)	
1969–1994	0.98	495.66	1.91 (11.22)	-0.31 (-1.62)	-0.14 (-3.93)

† Dummy variable equals 0 for 1969 to 1987, and 1 for 1988 to 1993. A significant value indicates that an adjustment to the equation occurred during the second time period.

Note: t-statistics given in parenthesis.

and local government sectors account for about 12% of business air travel. The remaining two-thirds of business air travel is primarily in the services sectors, including wholesale and retail trade, finance, insurance, and real estate, and a broad range of other services such as management consulting, legal, medical, and educational services. Telecommunications expenditures (discussed in the section below) are more highly skewed toward the communications (about a third of expenditures on communications come from other communications industries or companies), and are less likely to be affected by the downturn in aerospace and defense and declines in the number of manufacturing jobs.

Using BEA data (4), we identified the top 40 out of approximately 480 industrial sectors that accounted for 80 percent of business expenditures on business air travel in the late 1980s. (See Table 4.) This section evaluates these industries in terms of their past and future growth prospects, because to a considerable extent, the fortunes of these 40 sectors dictate the fortunes of the air industry.

Growth Prospects

As a whole, the top 40 sectors are forecast by the BLS (5) to grow slower than the national average. For the decade of the 1990s, the

median growth rate in employment for these industries is 1.0 percent and the average growth in real output is 2.1 percent. These compare with 1.3 and 2.7 percent, respectively, for the U.S. economy. Only 10 of the 40 top air travel industries are forecast to have faster job growth between 1992 and 2005 compared with their job growth during the period 1979–1992.

The top 10 business air travel sectors include the U.S. Department of Defense, which is undergoing cutbacks in funding and personnel; the U.S. Post Office, which is faced with increasing competition from the private sector, E-mail and facsimile machines; and public education, which is suffering from financial problems in many parts of the country. Several of the top sectors are considered to be high growth ones, at least in terms of employment. These include management consulting and retail trade. High growth manufacturing sectors, including semiconductors and computers, are also among the top industries. Although some growth in business air travel is expected from the manufacturing sectors, the emphasis placed on cost control could easily keep expenditures level, continue downward pressure on yields, and moderate the growth in enplanements.

Overall, the composition of industries that account for 80 percent of business air travel is changing, and future shifts will emphasize the trend toward the service sectors being the primary business air travel users.

TABLE 3 Test for Equality between Coefficients

Model	F Ratio	Reject Null Hypothesis at 5% Significance Level†	Reject Null Hypothesis at 1% Significance Level†
Linear	3.80	Yes	No
Log linear	13.06	Yes	Yes

† Null hypothesis is that the coefficients for the 1969 to 1987 period are equal (not significantly different from) the coefficients for the 1988 to 1993 period. For 5%, the F ratio must exceed 3.10 to reject the null hypothesis; for 1% the F ratio must exceed 4.94.

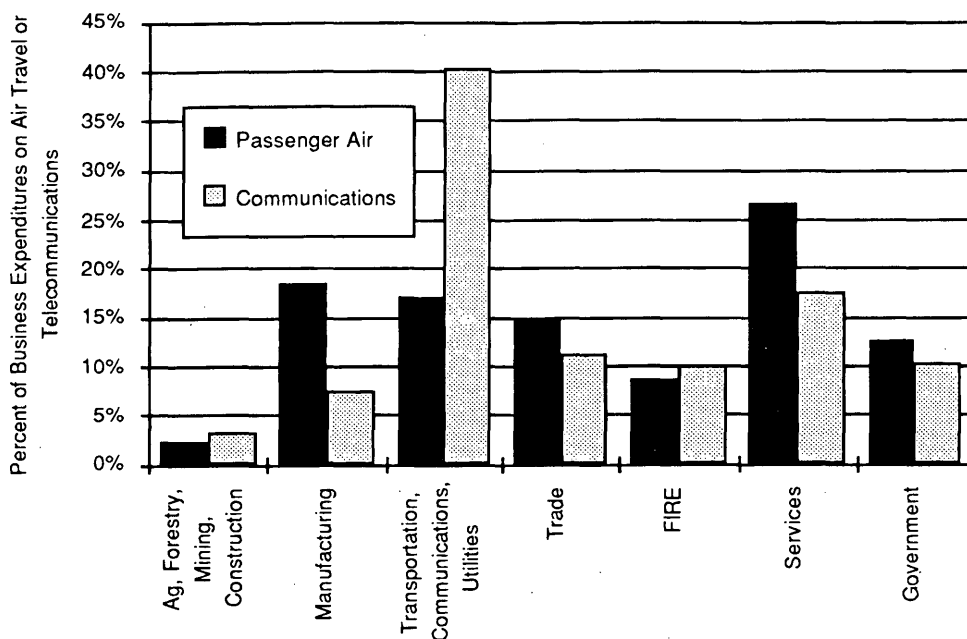


FIGURE 2 Distribution of air travel and telecommunications expenditures by sector.

USE OF TRAVEL MANAGERS

There has been a continued increase in the number of businesses using travel agents and travel managers to help control costs. The percentage of corporations that have corporate travel managers has grown from 7.5 to 38% between 1982 and 1993 (9). Nearly 80% of companies surveyed that spend more than \$5 million on travel and entertainment (T&E) have such a manager. The role of travel manager has become more important as companies take steps to control travel and formalize policies. These managers generally report to a corporate administrative office.

Data from the 1991 *Travel Weekly* survey indicate that 23% of corporate clients of travel agencies had written guidelines or policies that year. By 1994, this percentage increased to 38%. The major focus of the policies is on air travel. The percentage of agency bookings coming from corporate travel managers or coordinators increased from 9% in 1991 to 12% in 1994 (10). The American Express survey found that 64% of companies with 100 employees or more had formal written travel guidelines. Large companies are much more likely to have policies: 96% of companies with T&E budgets over \$5 million and 90% of companies with budgets from \$1 million to \$5 million report that they had formal written guidelines in place, compared with only 28% of companies with T&E budgets under \$100,000.

Variation is wide among companies and industries in terms of travel policies, cost control, and use of telecommunications. Companies in manufacturing and engineering industries are generally the most cost conscious. Any company, however, that operates in a very competitive environment carefully scrutinizes air travel and

looks for ways to control costs. At the other extreme, consulting, legal, some financial, and similar industries are lax in implementing and enforcing policies and are not aggressive in seeking out the lowest possible air fare. The type of trip most likely to be restricted is that involved with meeting other employees of the same company. Conversely, the type of trip least likely to be restricted is one involving sales calls to existing or prospective clients.

COMPETITION FROM TELECOMMUNICATIONS

All industries use telecommunications, and telecommunications expenditures generally exceed those of air transportation by about 2.5 to 1. The same is true for industrial sectors that are the mainstay of business air travel. (See Figure 3.) Many sectors that offer the greatest prospects for growth, however, also tend to be those that have the highest ratio of telecommunications expenditures to air travel expenditures: for example, trade, transportation, electronics and computers, and communications equipment and some business services. These industries are among those most likely to embrace telecommunications as an accepted means of doing business.

Other studies support the growing use of telecommunications. One indicates the extent of substitution should be 5 percent by 2000 and 25 percent by 2010 (2). Clearly substitution will depend on the availability and cost of telecommunications versus air travel, and also the acceptance of telecommunications compared with face-to-face contact. Telecommunications costs will continue to decline relative to air travel costs. The ability of communications to replace

TABLE 4 Estimated Expenditures on Air Travel by Selected Industries, 1977, 1982, and 1987

	1977	1982	1987	1982-87 Growth rate
	Millions of Dollars			
Wholesale trade	1,038	1,950	4,307	17%
Air transportation†	867	1,396	4,113	24%
Consulting services	316	773	2,641	28%
State and local government	785	1,210	1,866	9%
Federal government, defense	614	1,484	1,817	4%
Security and commodity brokers	124	647	1,243	14%
Associations	9	560	1,141	15%
Legal services	184	248	1,097	35%
U.S. Postal Service	460	695	906	5%
Retail trade	325	707	763	2%
Colleges, universities	187	291	664	18%
Federal government, nondefense	279	422	648	9%
Banking	90	181	599	27%
Aircraft	1,593	435	569	6%
Doctors and dentists	84	164	509	25%
Freight forwarders and other transportation services	98	200	483	19%
Periodicals	87	199	467	19%
Newspapers	225	500	445	-2%
Construction	222	296	433	8%
Real estate	98	219	418	14%
Electronic computers	121	481	341	-7%
Electric services (utilities)	96	229	325	7%
Engineering services	196	244	310	5%
Other business services	44	88	305	28%
Insurance carriers	130	283	288	0%
Other membership organizations	60	212	283	6%
Computer and data processing services	121	112	263	19%
Motor freight transportation and warehousing	56	118	232	14%
Accounting, auditing and bookkeeping, and	93	67	229	28%
Insurance agents, brokers, and services	47	91	205	18%
Radio and TV broadcasting	49	95	200	16%
Credit agencies other than banks	53	124	191	9%
Labor organizations, civic, social, and fraternal	58	98	184	13%
Communications except radio and TV	50	122	183	8%
Motor vehicles and car bodies	106	295	177	-10%
Industrial inorganic and organic chemicals	129	118	170	7%
Computer peripheral equipment			166	
Aircraft and missile engines and engine parts	77	147	165	2%
Agricultural, forestry, and fishery services	71	137	164	4%
Commercial printing	60	111	143	5%
Total business and government	12,163	21,912	35,526	10%
Personal consumption	12,769	20,574	29,349	7%
Exports	2,146	5,691	10,186	12%
Imports	-2,233	-3,931	-5,711	8%
Total industry output	24,846	44,245	69,350	9%

† Air Transportation includes imputed value of services provided by one airline to another.

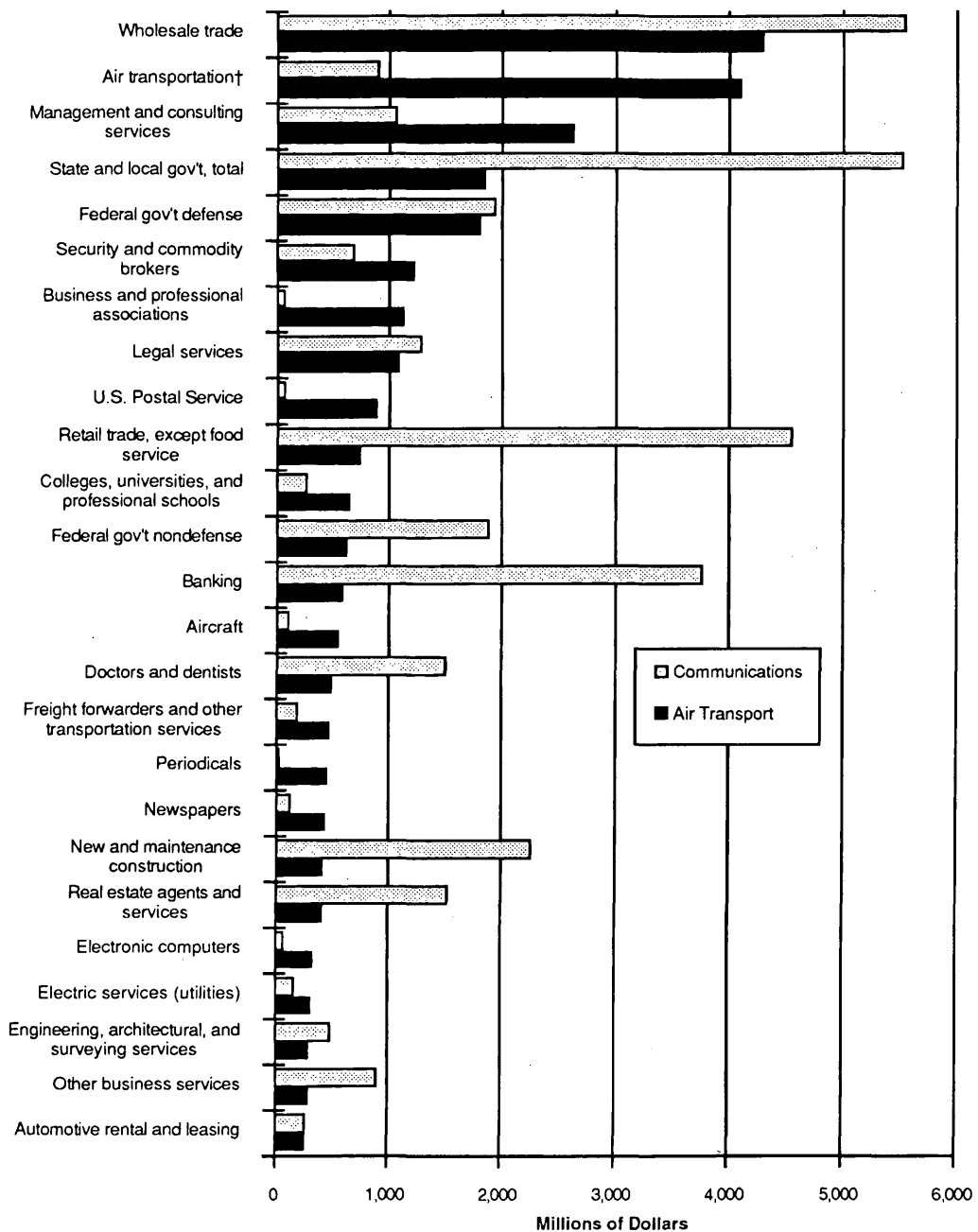
Source: U.S. Department of Commerce, Bureau of Economic Analysis.

face-to-face meetings may depend, to a large measure, on the underlying reason for air travel. Discussions with current users of teleconferencing suggest most of the existing applications are for intracompany meetings or for meetings involving companies that are working together on specific projects. Sales calls still generally are held face-to-face, and communications technologies have yet to provide an alternative for large-scale conferences, conventions, and trade shows.

About half of business travel is for meetings, conventions, and trade shows (10). The remainder of business travel is fairly evenly divided between intracompany business and intercompany business. The most likely candidate for replacement of business air travel is intracompany business, or about 25 percent of air travel. Discussions with travel representatives in several U.S. corporations

support the trend toward substituting communications for intracompany meetings. Several companies reported they have written policies restricting air travel, especially for meetings that only involve other employees. Not all intracompany travel can be substituted, for much of it requires physical presence, such as repair or installation of equipment of programs.

The possible small substitution of communications for business air travel (3) and the forecasted 5 percent substitution by 2000 are consistent with the regression equations presented previously in this report. They are also consistent with our understanding of the size and role of intracompany travel as a percentage of the total. Whether or not communications can reach 25 percent or more substitution will depend on technologies, customer acceptance, and costs, all of which are still major unknowns.



† Air Transportation includes imputed value of services provided by one airline to another.
Source: U.S. Department of Commerce, Bureau of Economic Analysis, 1987 *Input Output Tables*.

FIGURE 3 Passenger air transportation and communications expenditures for selected industries, 1987.
†Air transportation includes imputed value of services provided by one airline to another. Source: U.S. Department of Commerce, Bureau of Economic Analysis, 1987 *Input Output Tables*, 1987

CONCLUSIONS

There has been a definite downward shift in business air travel, as substantiated by econometric analysis. The downward shift started in 1988, at a time when the economy started into a recession and businesses began corporate restructuring and downsizing. Recent data confirm that the 1993 recovery did not produce the rebound that would be expected with previous demand elasticities.

We identified about 40 industrial sectors that account for 80 percent of business air travel expenditures. We examined these businesses for several factors, including growth prospects and willingness to use telecommunications. The results of this analysis support the contention that business air travel will not be as strong in the 1990s and in previous decades.

- Many of the traditional business travel industries are not performing well or are forecast to grow slower than the national average. Among these industries are defense, aerospace, and the U.S. Post Office.

- Most of the important business travel sectors spend more on telecommunications than air travel. Through anecdotal evidence, it is clear many of the larger companies are frequent users of new communications technologies, at least for intracompany meetings. Indeed, several companies have already mandated the use of telecommunications whenever reasonable or feasible.

- Changes that are slowing the growth of air travel include downsizing of middle management; increased control over corporate travel; and the spread of telecommunications, electronic mail, and electronic data interchange (EDI) for communications and contact with suppliers, customers, and employees. In many industries, the use of multiple communications technologies is changing how business people interact with each other.

The net affect of changing industry structure, cost control, and telecommunications on business air travel is uncertain. The industry shift, away from manufacturing and toward services should help increase enplanements, because of the faster rate of growth in sales and employment displayed by the service sectors. However, travel management and telecommunications are likely to place downward pressure on business travel growth with the result that overall business enplanements and expenditures on air travel will not grow as fast as in the 1980s.

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