

1964

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Recommended Citation

Philip Schary, *Competition, Regulation and the Air Freight Industry*, 30 J. AIR L. & COM. 62 (1964)
<https://scholar.smu.edu/jalc/vol30/iss1/3>

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COMPETITION, REGULATION AND THE AIR FREIGHT INDUSTRY

BY PHILIP SCHARY†

I. INTRODUCTION

THE domestic air freight industry has exhibited a steady growth since the filing of the first freight tariff in 1944. Traffic has increased from less than thirty million ton-miles in 1946 to almost 630 million ton-miles in 1962. This growth while sizeable has not been equally shared by the two carrier groups of the industry, the all-cargo airlines and the passenger-carrying airlines. As Table I demonstrates, since 1956 the passenger carriers (primarily the domestic trunk airlines) have gained at the expense of the all-cargo airlines not only in market share, but in absolute volume. The three all-cargo airlines which are operating today are the sole survivors of what was originally hundreds of non-scheduled airlines. The 1962 data shows the only reversal in this trend to be the re-entry of Slick Airways into active participation in the industry.

TABLE I
RELATIVE SHARE OF AIR FREIGHT GROWTH BY CLASS OF CARRIER

Year	Total Volume Ton-miles (Mil.)	Per Cent	Share by Carrier Class		
			Percentage Domestic Trunk	Local Service	All-Cargo
1955	284	0.0	61.2	0.5	38.3
1956	332	100.0	57.3	0.6	42.2
1957	376	100.0	58.2	0.6	41.3
1958	364	100.0	66.0	0.6	33.3
1959	426	100.0	66.3	0.7	33.0
1960	448	100.0	71.6	0.9	27.5
1961	468	100.0	82.1	1.2	16.7
1962	629	100.0	75.3	1.1	23.5

Source: 1962 ATA Facts and Figures, p. 23 (the percentages are calculated from the data).

In view of the decline of the all-cargo airlines in number and in relative market share, the question of their survival becomes increasingly important. Under Title I, Section 102 of the Federal Aviation Act of 1958,¹ the Civil Aeronautics Board (CAB) has the role of developing policies to encourage the growth of the air transport industry. By creating and modifying minimal standards for rates and service and establishing the policy of selecting carriers to develop this market through certification as common carriers, the Board has been a stimulus to the existing air freight industry.² One question of significant importance is whether its present policies en-

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¹ 72 Stat. 740, 49 U.S.C. § 1302 (1958) which supercedes an equivalent section under Title I, Para. 2 of the Civil Aeronautics Act of 1938, 52 Stat. 980, 49 U.S.C. § 403 (1938).

² For a description of current CAB activities in this area, see 1962 C.A.B. Ann. Rep. 19-22.

courage this growth or are they creating an environment in which the all-cargo carriers cannot survive?

This paper discusses some of the economic factors influencing the development of the industry, particularly the relationship of costs to revenue as it bears on competition. The cost structure for air freight will be described for both the passenger carriers and the all-cargo airlines and measured against revenues to establish relative profitability. This will lead to the hypothesis that the shift in the market share can be traced to differences in profit. This analysis will provide a basis to discuss some possible policy alternatives and their usefulness for the development of the industry. If profits are lacking, CAB policy must be directed toward restoring them if the goal of the development of the industry is to be realized.

II. THE NATURE OF THE PROBLEM

The question of survival of the all-cargo airlines is one of competition with the passenger airlines. We must first determine the magnitude of this competition and then look for possible competitive advantages of the passenger airlines over the all-cargo airlines. From such evidence, implications can be drawn for the future performance of the industry, and these in turn can suggest guidelines for policy alternatives.

The existence of competition between the two types of carriers depends upon the presence of a homogeneous market. A common test of homogeneity is whether the prices of different suppliers bear any market relationship to each other, *i.e.*, in economic terms, is there a cross elasticity of demand among the carriers? Evidence of the essential unity of the market can be found in the price schedules for the service. On the supply side, the passenger airlines have demonstrated this homogeneity by offering freight service in both passenger and all-cargo aircraft. While some technical distinctions are made in maximum sizes, schedule speed and frequency, no price distinctions are made by the carriers offering both types of service. This same homogeneity is evidenced on the demand side between the two classes of carriers. Shippers are particularly sensitive to rate differences between carriers, and this is reflected in intense price competition shown by closely matched price lists in the carriers' tariff filings. In summary, there is little distinction in the market between the two types of service, and they can be considered to be in direct competition with each other.

The passenger carriers have an obvious advantage over the all-cargo carriers in the number of schedules offered. Because every passenger aircraft can potentially haul freight, every passenger schedule is capable of being classified as a freight schedule. The all-cargo carriers are limited in comparison. This advantage would not be as significant if all-cargo schedules were more highly developed with more investment directed into all-cargo aircraft. The lack of investment suggests low profits due to high costs relative to revenues. The real advantage of the passenger airlines in freight movement lies in the nature of their incremental costs. As long as freight is handled on passenger aircraft, it can be treated as a by-product of passenger service and will avoid any direct transportation charges. The only charges that this traffic must bear are the terminal charges at the ends of the flight.

In contrast, the cost of moving freight by all-cargo aircraft is considerably higher, and includes not only the terminal costs, but also the costs of operating the aircraft. These include crew salaries, fuel, maintenance, insurance and depreciation.³ These costs vary with the type of aircraft flown, the average length of the route segment and the airline's operating and maintenance policies. Costs vary also with the volume of traffic and thus become incremental in the sense that they are proportionate to the amount of freight carried.⁴

If it is not a by-product of a passenger service, a shipment will incur direct costs of transportation from one airport terminal to another, plus a portion of the terminal cost which can be charged to that portion of traffic. In a longer view, the cost of air freight includes not only these directly incurred expenses, but other costs such as sales, administration and other overhead expense items which are indirectly related to the air freight side of the airline business. The ability to identify the incremental costs of air freight service in airline accounts is limited. Some costs such as the cost of operating freight terminals and all-cargo aircraft may be isolated, but many other costs cannot be. Some administrative costs of passenger airlines may be caused by both passenger and freight traffic and thus cannot be divided except by arbitrary accountants. Other costs are potentially identifiable but are hidden within broad accounting classifications. Curiously, the all-cargo airlines also have similar cost identification problems in dividing common overhead costs between their freight operations and their other sources of business. Total costs for freight are therefore approximations and appear precise only by arbitrary cost allocations.

The importance of the incremental cost concept is in tracing the way in which these costs behave with changes in the volume of traffic. The costs of passenger airlines differ from those of the all-cargo airlines because of the by-product element of freight on passenger airlines. As an airline develops freight traffic, it will first seek to utilize its lowest cost capacity, *i.e.*, the capacity available on its passenger aircraft.⁵ Because of package size restrictions, limited schedules offered at the most opportune times for freight movement, and the low revenue priority for freight as compared to mail, express and baggage, this immediate capacity may be filled before demand is satisfied. The purpose behind the all-cargo service on the passenger airlines is then to supplement the service offered on their passenger aircraft. The importance of all-cargo service to the passenger airlines can be seen in Table II. Among this airline group, the passenger airlines that were carrying the largest volume of freight traffic were also the most heavily committed to the use of all-cargo equipment. Of the eleven domestic trunk airlines, only three carriers did not use all-cargo equipment during 1962.

³ Depreciation could be considered to be a sunk cost in the sense that an aircraft once purchased is "committed" to the airline. However, aircraft are highly mobile capital equipment, and can be transferred to many services on an airline, *e.g.*, from one route to another, and also from one airline to another through sales, lease, etc., and are thus considered here to be related to output.

⁴ An incremental cost is defined here as the cost incurred for the next unit of output.

⁵ Potentially, this can represent a large amount of available lift. Each Boeing 707 has a baggage compartment capacity of approximately 18,000 lbs., the Douglas DC-8, 14,000 lbs. This can be compared to an aircraft commonly used for all-cargo services through the early 1950's, the DC-4, which had a total payload of about 18,000 pounds when used exclusively for freight.

TABLE II
FREIGHT CARRIED BY DOMESTIC TRUNK AIRLINES
IN 1962 BY TYPE OF AIRCRAFT

Carrier	Total Freight Carried		By Passenger Aircraft		By Cargo Aircraft	
	Ton-miles (000)	Per Cent	Ton-miles (000)	Per Cent	Ton-miles (000)	Per Cent
American Airlines	153,824	100.0	73,203	47.6	80,621	52.4
Braniff Airways	13,724	100.0	9,688	70.6	4,036	29.4
Continental Airlines	9,708	100.0	9,708	100.0	—	—
Delta Airlines	31,027	100.0	25,219	81.3	5,808	18.7
Eastern Airlines	27,681	100.0	21,108	76.3	6,573	25.7
National Airlines	19,595	100.0	13,669	69.8	5,926	30.2
Northeast Airlines	3,342	100.0	3,342	100.0	—	—
Northwest Airlines	19,435	100.0	18,042	92.8	1,393	7.2
Trans World Airlines	63,689	100.0	46,505	73.0	17,184	27.0
United Airlines	126,837	100.0	71,216	56.1	55,621	43.9
Western Airlines	5,706	100.0	5,706	100.0	—	—

Source: ATA, Flight and Traffic Statistics (data from pages entitled Domestic Trunk Airlines, Twelve Months Ending December 31, 1962, Total of Scheduled Airlines Service, and Domestic Trunk Airlines, Twelve Months Ending December 31, 1962, Non-passenger Service Operations).

To further illustrate the use of all-cargo equipment on passenger airlines, comparisons have been made in Table III for the years 1956 and 1962 of the changes which have occurred in total passenger aircraft cargo capacity available, and the traffic volumes moving via these carriers on passenger aircraft and all-cargo aircraft.⁶ The data reflects the enormously large increase in capacity available on passenger aircraft, so that a total growth of the traffic carried was reflected by traffic increases on passenger aircraft which exceeded those on the all-cargo aircraft of the same airlines by three and one-half times. Data for 1960 showed almost the reverse. At that time, increases in freight on passenger aircraft had increased only two per cent over 1956, the growth going to the all-cargo service of these carriers. However, even the expansion of jet passenger cargo capacity has not prevented an increase in the use of all-cargo equipment.

TABLE III
CHANGES IN CAPACITY AND TRAFFIC ON
DOMESTIC TRUNK AIRLINES, 1956-1962
(Ton-miles 000,000)

Year	Capacity	Total Ton-miles-Carried	By Passenger Aircraft	By All-cargo Aircraft
1956	1248	332	183	149
1962	4225	475	297	177
Percentage Increase	339%	43%	62%	18%

Source: ATA, Flight and Traffic Statistics.

The incremental cost of carrying freight for the passenger airlines has two steps. The first reflects the lower cost of by-product capacity. The second stage is where all-cargo capacity is used and therefore shows higher

⁶ Capacity was estimated by taking total ton-miles available during the given year, subtracting that capacity which could not be used for freight (exclusively passenger seat-mile capacity converted to ton-miles), baggage allowance, and the mail, express, and excess baggage, and cargo carried on cargo aircraft. The remainder provides a minimal estimate of capacity which could have been utilized for freight movement. Because all seats were not filled, this tends to understate actual capacity available. However, the choice of routes and schedule times tend to reduce it.

cost. The airlines have naturally sought to minimize the use of all-cargo equipment. However, with increases in freight traffic which do not fit the passenger schedules or where no more capacity is available, schedules must be met by the use of all-cargo aircraft.

For the all-cargo airlines, costs can be projected more easily. All changes in the volume of traffic are reflected eventually in changes in aircraft miles flown, and the costs are directly proportionate to the traffic.

For both carrier groups changes in air freight volume independent of other demands require the use of all-cargo equipment. This implies parallel incremental costs of freight operation reflecting the use of high operating cost resources. If by-product and all-cargo costs are averaged for each carrier, the passenger airlines clearly have lower costs because their average costs include the first step of by-product capacity. The relevant costs for airline managers, however, are not the averages but the costs of supplying the next unit of capacity which are the incremental costs of all-cargo service.⁷

We cannot explain directly the shift in relative market share in terms of cost if the incremental costs are equal. However, if the incremental costs are larger than the associated revenues, this would explain the tendency of both groups of carriers to want to reduce this type of service. For the all-cargo airlines, apparently unprofitable freight business has encouraged them to pursue other more profitable markets such as charter and military contract operations. Only when these sources of revenue are not available is air freight attractive to them. For the passenger airlines, incremental costs may also exceed revenues although average costs may be less than average revenues and freight is therefore profitable on an overall basis.

Why, then, is there continued investment in this seemingly unprofitable industry? For the all-cargo airlines, the scheduled freight operations become a means of cushioning otherwise very erratic revenue fluctuations. For the passenger carriers, air freight may be considered a long-term investment where the future market position may produce potential rewards exceeding the present costs. In addition, the retention of the present air freight business may depend on the constant availability of sufficient standby capacity to serve the market, *i.e.*, all-cargo equipment. Another possibility is the imprecision of establishing a true incremental cost because of the nature of costs so that management may only be able to gauge the worth of participation by the revenues that it contributes to the total operation.

The implication of this discussion is that the decline in all-cargo carrier market share suggests a lack of profit.⁸ If these conditions continue, the all-cargo carriers could eventually withdraw completely, and the remaining service would be closely tied to the support of passenger service. Is this consistent with the CAB's policy commitment to the development of the industry? Or is the policy intended to create fully self-supporting carriers that can develop this business independently of other sources of revenue?

⁷ This was reflected in the CAB findings in the original Air Freight Rate Investigation, 9 C.A.B. 340, 344 (1948).

⁸ Because of the impossibility of identifying the full costs of freight service, even for all-cargo airlines, concerning profitability, conclusive evidence could not be presented from CAB data. However, profit and loss accounts for these carriers including other revenues also support this implication.

III. POLICY ALTERNATIVES

We have already mentioned the unprofitable condition of the air freight industry under the present CAB policy. If possible, some policy alternatives should be available to improve the financial condition of the industry and promote its further development (excluding direct subsidy). Before examining other alternatives, we should specify some of the conditions laid down under present policy. These fall into three categories: (1) entry controls, (2) minimum rate levels and (3) service level controls.

Entry controls have been mentioned earlier. The purpose behind them was to protect the industry against excessive competition which apparently tended to drive rates below cost established by the CAB.⁹ Of the four carriers which were selected for certification as common carriers in 1949, only two remain.¹⁰ In 1956, two additional carriers were granted certificates, of which only one is still operating in the air freight industry.¹¹ This suggests that even the regulatory process has failed to halt the pressures of competition and unprofitable operation.

Minimum rate controls were instituted at an even earlier date than entry controls. In 1948, the CAB, recognizing the vulnerability of the all-cargo carriers to the cost structure of the passenger carriers, passed a Minimum Rate Order which established rates on the basis of the operating costs of all-cargo equipment. This order was modified in subsequent proceedings, but allowed to stand until 1960 at which time it was revoked in order to remove the inhibiting effect of regulatory rate standards on individual carrier rate structures. In recent years, rates have been almost consistently higher than the levels under the minimum rate level, and the competitive performance of the industry leads to the conclusion that these legal minimum rates have actually been maintained at levels below cost.

Closely related to the rate levels has been the service level. As the industry has developed, the time requirements of the service have tightened considerably. From the two-day service associated with the early post-war years, the time dimension has been reduced to overnight service along the main routes and one-and-a-half day service elsewhere. The time reduction and seasonal overcapacity led the Board to distinguish between two types of service: one at the "standard" level of rates, which was overnight, and a lower level "deferred service," which was to be used to fill out otherwise unused capacity. This, however, required a minimum four-day transit time between pick-up and delivery at substantially reduced rates.¹² This allowed carriers to discriminate among traffic on a time basis, and it has also tended to preserve minimal service standards for the "first class" service.

The constraints of present policy have led to a firmly established concept of regulation in which the restriction on entry, rates and service standards have been bound together in a related combination. In considering policy recommendations, many alternative combinations of these variables could be explored to examine their potential effects on the industry. Only a few which appear more plausible can be included here.

The fundamental alternative to regulation is the removal of all entry

⁹ Air Freight Rate Investigation, 9 C.A.B. 340 (1948).

¹⁰ Air Freight Case, 10 C.A.B. 572 (1949).

¹¹ Air Freight Certificate Renewal Case, 23 C.A.B. 186 (1956).

¹² The four-day time period refers to trans-continental service, three days being allowed for intermediate service. See The Deferred Air Freight Case, 23 C.A.B. 651 (1956).

controls to allow free competition. This condition existed prior to CAB intervention in the industry in 1948 when the all-cargo airlines petitioned for minimum rate protection.¹³ A return to these conditions could serve to drive out the all-cargo airlines, or it could force a radical change in the type of service available. While any comments on this type of policy are conjectural, it does not appear to be feasible within the present climate of transportation policy. However, it does serve as an alternative to non-optimal regulatory policy.

A second alternative is to maintain service at the present time dimensions and to explore possible changes in rate levels. One possibility would be to continue the present policy without substantial change. However, this would obviously further the present industry competitive trend. The principal argument for this approach is that it has a continuity with past regulatory experience and is consistent with the investment decisions of the carriers that have been made under it. As suggested earlier, incremental costs are not covered by revenues, and the operating losses would encourage further withdrawal of all-cargo services in addition to further dependence on the by-product capacity from passenger service.

Another possibility within the present level of service is to raise the rate level. This is only feasible if demand for the service is inelastic and therefore would not be reduced. This does not appear consistent with further development of the industry. Even if the industry could be made self sufficient and all-cargo service became profitable, the growth of the industry would depend on secular forces outside the control of the industry.

A further variation in policy would be to recognize the dependency of air freight on support from passenger revenue. Policy would then be directed toward encouragement of more joint-cost operations, *i.e.*, combination passenger-cargo flights with cargo occupying more of the payload capacity than is done now under baggage compartment loading. Aircraft could be modified for flexible loading of passengers and freight with the proportions depending on traffic demand. This has been tried by several airlines in the past and could be further developed with more competitive equipment. Where evening passenger schedules may be marginally revenue-producing, combination flights could contribute more revenues than either type of service alone. However, this alternative does have the disadvantage that freight schedules would not be operated independently of passenger movements. Another type of combination in operation would be the use of freight aircraft with convertible interiors, changeable between passenger and freight service, so that daytime schedules would be operated for passenger services and nighttime schedules for freight.

While these alternatives do not provide for independent operation of air freight service, they may provide financially profitable operations within the present service constraint. But at the same time, they sound the death knell for the all-cargo carriers unless they are allowed to carry passengers.

The third element of regulation in the industry has been the time dimension. The standard air freight service today is sold to the shipping public on an overnight basis geared to the time dimensions of the business day. The freight is picked up in the later afternoon, and delivered, if possible,

¹³ Air Freight Rate Investigation, 9 C.A.B. 340 (1948).

the next day. Because of the time requirement for terminal processing, the aircraft that carry this freight are bound by schedules that are even shorter. Utilization of all-cargo equipment is therefore low, requiring the capital investment to be spread over very few flight hours.¹⁴ In addition to the daily schedules, a lack of traffic on the weekends contributes to this dilemma. In the desire to sell a premium freight service, the airlines with the sanction of the CAB have developed an exceedingly high cost service. Announcements of new cargo aircraft have included promises of lower operating costs. Low operating costs require efficient utilization, but how can more efficient aircraft lower the cost of service sufficiently if their depreciation costs are spread over so few hours of flight time? This problem becomes imperative when we compare capital costs of new equipment with the costs of aircraft that are now contributing to the high cost dilemma.¹⁵

One possible solution to this problem of high cost may be found in changing the total service and rate combination which has governed the industry. If the one-day service which is presently being offered to the shipping public is changed to a longer time period, possibilities of reducing cost become apparent. Air freight as a two-day service would allow operating schedules free from the direct pressure of traffic. Freight could be moved in a continuous shuttle with much improved utilization of both the aircraft and ground facilities. By reducing peak hour demands on facilities, operating aircraft in a more optimal manner, and encouraging limited backlogs of traffic to provide for more efficient use of the aircraft that are flying, the costs can be reduced.

The reduced service level then requires an estimate of the price level necessary to attract traffic under these new conditions. This will depend on the competitive time advantage left to air freight over surface competition. If sufficient time advantage still remains, it may be possible to attract traffic at rates sufficiently high to cover the lower costs of service. Estimates of demand for premium freight service have been necessarily crude given the limited data available. Several estimates published by aircraft manufacturers indicated volumes vastly exceeding present capacity.¹⁶ These estimates have been based on known traffic moving today via common carrier trucking, rail forwarder, rail less carload, and express over distances where airline competition could be effective. All of this is not potential air freight, even when it is moving between parallel points, but the proportion becomes larger the lower the rates become.

To return to the original problem, what could happen to the industry structure and the fate of the all-cargo carriers? One possibility is that all of the capacity on passenger aircraft not now being used because of schedule times, would then absorb all of the additional traffic generated at lower rates. This would provide a new advantage in terms of the cost to society by utilizing capacity for which the cost is already being incurred. The excess would be carried on all-cargo equipment, presumably at costs less than the revenues. The two problems which have to be faced in analyzing this alternative are whether costs can be reduced sufficiently so that the

¹⁴ Utilization data for the DC-7F all-cargo aircraft for 1962 indicates average daily utilization of approximately five hours per day compared to an average of eight or more for passenger aircraft flying comparable route patterns.

¹⁵ In 1953, a DC-6A cost \$1,150,000. A DC-8F Jet Freighter today will cost \$6,688,000.

¹⁶ See, e.g., Brewer, *Air Cargo, The Next Ten Years*, Boeing Airplane Co., Seattle, Wash., (1957); Douglas Aircraft Co., Rep. No. SM 23088, *The Air Cargo Handbook* (1958).

revenues can attract the necessary volume of traffic and whether demand would be sufficient to require all-cargo service.

The alternatives mentioned above presume a policy of continuing competition within the industry by both carrier groups. An additional choice open to the Board was suggested by a recent "white paper" submitted to the CAB by the all-cargo airlines.¹⁷ They argue for limiting competition by barring the domestic trunk airlines from carrying freight in all-cargo aircraft, limiting their activity in the field to whatever they can carry on passenger flights. To support their case they urge a recognition of separate roles for the two classes based on the historical precedent of the original finding of need of all-cargo service by the Board when the carriers were originally granted common carrier status.¹⁸

Without examining the legal basis for this argument, the case on economic grounds seems tenuous. This alternative is a proposal to protect some of the competitors in the industry against the others, limiting competition in order to preserve the position of the all-cargo airlines. If all-cargo operation in its present form is not profitable for either group, the argument says that traffic should be diverted from the trunk airlines to the all-cargo airlines in order to increase their load factors. If this would make all-cargo service profitable for them, could not this argument be turned around, and presented in favor of the domestic trunk carriers, so that they would carry the freight instead of the presently unprofitable all-cargo carriers?

There is no need to advance the merits of either side here. The choice is really between a protectionist philosophy of regulation, and one which will advance the public economic welfare by means of more thoroughgoing competition. Instead of seeking ways to block competition, we should be seeking more imaginative ways to make it work.

IV. CONCLUSION: REGULATORY DILEMMA

In this article we have noted the decline in the relative share of the market for the all-cargo airlines. In analyzing the reason for this decline, we noted that the relevant cost was the cost of all-cargo service, and that this cost appeared to exceed the revenues for the service. The net result was a trend toward a withdrawal of resources from the industry. Because this industry condition is the result of present regulatory policies, this policy and its alternatives were explored to see if better results are possible than under present policies. One approach was to abandon regulation, but results could not be predicted. Two alternatives within the regulatory scheme were posed which have some chance of success. One is to increase the dependency on passenger service by encouraging the further extension of joint passenger-cargo operations. While this would promote more profitable service for the passenger carriers, it would exclude the all-cargo carriers from further participation in the market. A second alternative is to reduce the service standard for the normal categories of air freight in order to reduce costs of operation which would then permit reduced rates, the most effective way to expand the market for air freight. However, this way is also un-

¹⁷ The Role of All-Cargo Aircraft in the Domestic Airfreight Industry, submitted in unpublished form to the CAB by The Slick Corporation, The Flying Tiger Line, Inc. and Riddle Airlines, Inc. (1963).

¹⁸ Air Freight Case, 10 C.A.B. 572 (1949).

certain depending on whether the costs can be reduced sufficiently, and whether the demand will be attracted in volumes and at rates sufficiently high to cover the costs of the service.

The present policies will not preserve the industry as it is today. One alternative is to make the service more profitable by wedding it more tightly to the passenger side of the airlines, but this will not encourage the full development of the industry. The other is to make a break with the past policies to provide a slightly lower quality service at a much lower cost. While this path is more uncertain, it may provide the only way to encourage an all-cargo service, by either passenger or all-cargo airlines.

In developing alternatives to a policy which is having adverse effects on the industry, we are forced to recognize that no policy under regulation will create optimal solutions. However legitimate the causes which led to regulation of the industry, they have created a dilemma from which there is apparently little escape.*

* Editor's note: After this article was completed, trade news sources reported that the CAB was contemplating an enlargement of the authority of all-cargo and supplemental airlines and a curtailment of trunk airline air-cargo operations. See *Aviation Week & Space Technology*, Feb. 3, 1964, p. 41. If this proposal is formally approved by the Board its implications will be considered in a future issue of the *Journal*.