

Winter 2001

The Evolution of Fractional Ownership: A Literature Review

D. Scott Worrells
worrelld@erau.edu

David A. NewMyer
newmyer@siu.edu

Jose R. Ruiz

Follow this and additional works at: <https://commons.erau.edu/jaaer>

Scholarly Commons Citation

Worrells, D. S., NewMyer, D. A., & Ruiz, J. R. (2001). The Evolution of Fractional Ownership: A Literature Review. *Journal of Aviation/Aerospace Education & Research*, 10(2). <https://doi.org/10.15394/jaaer.2001.1277>

This Article is brought to you for free and open access by the Journals at Scholarly Commons. It has been accepted for inclusion in Journal of Aviation/Aerospace Education & Research by an authorized administrator of Scholarly Commons. For more information, please contact commons@erau.edu.

**THE EVOLUTION OF FRACTIONAL OWNERSHIP:
A LITERATURE REVIEW**

D. Scott Worrells, David A. NewMyer, and Jose R. Ruiz

Fractional ownership of business aircraft has evolved into a major force affecting not only business aviation, but also all of general aviation. This paper provides a history of fractional ownership, an explanation of how it works, the climate that has fostered its growth, how it compares to other "traditional" means of air travel, and an examination of challenges affecting its future.

There are three key findings in this paper. The first is that a range of usefulness has evolved for fractional aircraft ownership as compared to total aircraft ownership or charter services. This range of usefulness, based on a compilation of data from several authors, is between 145 and 387.5 annual flight hours. Second is that fractional ownership has redefined the business aircraft consumer, reducing the up-front acquisition cost and providing convenient access to business aircraft. An individual with an annual income of \$10 million or a company with annual revenue of \$30 million have become, through fractional ownership programs, the new business jet consumer target markets. Third is that fractional ownership has had a major commercial and economic impact on general aviation due to tremendous growth rates.

Key sources used in compiling this paper included articles from a number of aviation industry publications and journals, as well as government publications.

BACKGROUND

Aircraft are used to facilitate commercial and economic opportunity. Scheduled air carriers, or various types of general aviation companies have traditionally fulfilled the air transportation needs of those engaged in commercial and economic enterprise. Over the past decade a new concept in business travel has developed. That concept, fractional ownership, has had a dramatic effect on the aviation industry.

Fractional ownership costs are limited to the initial share purchase, the monthly management fee, and the hourly aircraft utilization charge (Bradley, 1995). Fractional ownership agreements provide for the purchase of a share of a business aircraft. Rather than procure an entire aircraft, a fractional owner makes a down payment, pays a monthly management fee and pays for occupied hours flown. Share size is based upon anticipated flight hours required in a year. This is also called the shareholder's forecast annual utilization rate.

Fractional ownership growth is estimated at 50% per year (Lowe, 2000, March). There are three major U.S. fractional providers; NetJets, Bombardier FlexJets, and Raytheon

Travel Air. Fractional ownership programs are also available in Europe, and the Middle East. Fractional shares of small single engine aircraft (Gilbert, 1999, April) up to and including the Boeing Business Jet (B-737) are available (Collins, 1998).

The emergence of fractional ownership as a major force affecting the aviation industry has not occurred without overcoming a variety of obstacles. The brief recession of 1990 nearly spelled the end for fractional ownership (Moll, 1999). Having weathered that storm the most recent question facing fractional ownership is how it will be regulated. Since its inception, fractional ownership has benefitted from being regulated under Federal Aviation Regulation (FAR) Part 91. This fact alone has enabled fractional ownership to grow exponentially into this century. The recommendations of the Fractional Ownership Advisory Rulemaking Committee (FOARC), convened in October 1999, are presently under review by the Federal Aviation Administration (FAA) ("National Business Aviation Association: Alert Bulletin," 2000). The FAA's response to FOARC's recommendations may provide fractional ownership with its first challenge of the 21st

The Evolution of Fractional Ownership

century. For example, if regulations governing fractional ownership use are tightened significantly, future aircraft orders driven by fractional ownership growth may be jeopardized.

The purpose of this paper is to provide a detailed explanation of the evolution of fractional aircraft ownership with a focus on corporate/business aircraft use. This explanation is based upon: an historical perspective of fractional ownership; a review of how fractional ownership programs work, including the climate that has fostered their growth; and a definition of terms in the context of fractional ownership. A comparative analysis of fractional ownership with traditional modes of air travel will also be presented. This paper then provides a discussion of the future challenges presently faced by fractional ownership programs exemplified by establishment of the FOARC. Finally, key findings of this paper are provided.

FRACTIONAL OWNERSHIP

History

Fractional ownership in its current form was launched in 1987. It evolved from a program that began in 1964 when the Pennsylvania Railroad put up the capital to finance Executive Jet Airways. Ten Learjet 23's were purchased with the mission to sell "blocks of usage" providing customers with business jet transportation wherever they wanted to go. The concept was based upon the Air Forces' Special Air Mission Squadron ("Executive Jet," 2000). In the Air Force program when an aircraft was dispatched from one location to another it would remain there until needed for another flight. Ideally, the next flight would originate from the aircraft's present location, if not it would be positioned for use at the nearest point of need. From the outset of Executive Jet Airways to the present, the cost of these "positioning flights" or "deadhead legs" were invisible to the customer who paid only for "occupied flight hours" (Collins, 1998).

The name of the company was changed to Executive Jet Aviation in 1965 and, at the same time, opened operations in Europe. In 1974, 12 Learjet 24Ds were purchased beginning what was to become a string of record-setting business jet purchases. In the same year a Middle East operation began, only to be nationalized soon thereafter. By this time, the European operation had been sold. Executive Jet Aviation continued domestic operations and broadened its scope of aircraft, beyond the range of Learjets, in an attempt to approach new markets; at one point adding a Boeing 707 to its fleet (Collins, 1998).

Executive Jet Aviation was purchased by RTS Capital Services in 1986. The name was changed to Executive Jet, Incorporated., and Richard Santulli became the organization's Chief Executive Officer. Executive Jet, Inc., is the parent company of the NetJets fractional ownership program (Collins, 1998). The basis of the fractional ownership concept was to combine the flexibility of chartering with the advantages of ownership. As has been shown, this concept was not new, however the genius of fractional ownership came in the form of a "core fleet" of aircraft. "The 'core fleet' is a group of airplanes owned by the fractional ownership provider directly and not resold to users. This fleet is used to supply transportation to share owners when the inevitable scheduling conflicts occur" (Norris, 1999, pp. 96, 98, 100). The application of the core fleet concept has proven to be the basis of fractional ownership success.

How Fractional Ownership Works

Gleimer (1999) provides the following definition of fractional ownership programs:

In general terms, fractional ownership programs are multi-year programs covering a pool of aircraft, each of which is owned by more than one party and all of which are placed in a dry lease (Clark, Boardman, & Callaghan, 1991) exchange pool to be made available to any program participant when the aircraft in which such participant owns an interest is not available. As an integral part of these multi-year programs, a single management company provides the management services to support the operation of the aircraft by the owners (Gleimer, 1997), and administers the aircraft exchange program (14 CFR 91.501) on behalf of all of the participants. By purchasing an interest in an aircraft that is part of the program, an owner gains round-the-clock access to a private jet at a fraction of the cost. In addition to access to the aircraft in which it owns an interest, it also has access to all other aircraft in the program, as well as the support of a management company that will handle all arrangements relating to maintenance, crew hiring, and all administrative details relating to the operation of a private aircraft (Field, 1996; Bradley, 1996; Jacobs, 1995; & Velocci, 1994). (pp. 980, 981)

Share size determines the amount of the down payment,

the monthly management fee, and the annual flight hour allocation. For example, a 1/4 share will require a down payment equal to 1/4 of the manufacturer's suggested retail price. The down payment secures the 1/4 share and access to the aircraft, or through the interchange agreement, another aircraft in the program (Gleimer, 1999), 24 hours a day, seven days a week for up to 200 hours of occupied flight time per year. The monthly management fee is also related to the share size and covers all operational costs of the aircraft. This fee takes care of pilots, maintenance, catering, and all other operational aspects of owning a private jet (Gleimer, 1999). Share sizes are typically available incrementally from 1/16 or 50 flight hours per year; 1/8 or 100 flight hours per year; 1/4 or 200 flight hours per year; to 1/2, 400 flight hours per year (Lowe, 1999, November). Shareowners may "upgrade" to a larger aircraft, or "downgrade" to a smaller aircraft, trading flight hours based upon a predetermined exchange rate (Lowe, 1999, November). Share size also determines simultaneous availability of multiple aircraft (Lowe, 1999, November); the larger the share the more likely multiple aircraft are available. There is also a fee charged for occupied hours flown. This fee is based upon the type of aircraft purchased. Hypothetically, a 1/4 share owner of a Bombardier Challenger 604 would be charged a \$5.618 million down payment, a \$34,452 monthly management fee, and \$2,563 for each of the 200 hours allocated by the 1/4 share (Harrison, 1999, December). Table 1 provides some basic fractional ownership cost information for the Gulfstream IV/Gulfstream IV SP, the Hawker 800/Hawker 800XP, the Beechcraft 400A, and the Beechcraft King Air B200. Information is presented for both new and used aircraft of the same type.

A major benefit of fractional ownership is that the top three providers, and most of the new entrants, do not charge for "deadhead" flight segments. A deadhead leg is one in which the aircraft is positioned for subsequent use. In a fractional ownership deadhead legs are required to position aircraft for a share owners' use, position the aircraft for one of the other aircraft shareowners' use, or return the aircraft to its base of operations. If a fractional owner operates to and from the same point of origin, the benefits of a fractional share can be substantially diminished. However, positioning flights are common and more frequent deadhead legs further justify fractional ownership (Esler, 1998). In 1998 NetJets estimated that 35% of their annual utilization was for positioning flights (Moll, 1999). According to an National Business Aviation Association (NBAA) survey (1998), 8.4% of their members' annual utilization was used for positioning purposes ("National Business Aviation Association. Operator profile and benchmarking survey: Utilization", p. 65).

The benefits of fractional ownership, regarding the deadhead segments and the availability of multiple aircraft, have enabled the traditional flight department to become more efficient and effective through the use of "supplemented lift." The term "supplement lift" describes the use of a fractional share to supplement an existing corporate fleet. Supplemental lift is used to reduce the costs of deadheading, to facilitate maintenance schedules, and as a fleet multiplier when the demand for aircraft exceeds the flight departments existing fleet (Esler, 1998). This provides a flight department operational flexibility and an opportunity to evaluate additional aircraft types and their procurement requirements/specifications.

The Evolution of Fractional Ownership

Table 1

Fractional Aircraft Ownership-New/Used Aircraft Comparison

Type of Aircraft	Down-payment 1/4 Share 200 Hours/Year	Monthly Management Fee	Hourly Rate + Tax
Gulfstream IV SP	\$7,400,000	\$39,000	\$3,051
<u>Gulfstream IV* (Used)</u>	<u>\$5,500,000</u>	<u>\$27,500</u>	<u>\$2,916</u>
Difference in Dollars	\$1,900,000	\$11,500	\$ 135
Difference in Percent	25.7%	29.5%	4.4%
Hawker 800XP	\$3,055,000 ⁺	\$20,390 ⁺	\$1,808 ⁺
<u>Hawker 800* (Used)</u>	<u>\$1,887,500⁺</u>	<u>\$15,900⁺</u>	<u>\$1,483⁺</u>
Difference in Dollars	\$1,167,500	\$ 4,490	\$ 325
Difference in Percent	38.2%	22.0%	18.0%
Beechjet 400A	\$1,607,000	\$14,990	\$1,355
<u>Beechjet 400A (Used)</u>	<u>\$1,050,000</u>	<u>\$13,250</u>	<u>\$1,328</u>
Difference in Dollars	\$ 557,000	\$ 1,740	\$ 27
Difference in Percent	34.7%	11.6%	2.0%
King Air B200	\$1,016,000	\$13,320	\$ 799
<u>King Air B200 (Used)</u>	<u>\$ 425,000</u>	<u>\$ 3,000</u>	<u>\$ 702</u>
Difference in Dollars	\$ 591,000	\$10,320	\$ 97
Difference in Percent	58.1%	77.5%	12.1%

Note. *Used aircraft data was not available for the Gulfstream IV SP or the Hawker 800XP. + Costs for the Hawker 800XP and the 800 were available from two sources, the table reflects an average of the two. Table was compiled from data available from Conklin & de Decker (1999, Spring, p. F-4).

Aircraft availability is essential to the success of a fractional ownership program. Aircraft availability is enabled by the core fleet, by limiting the number of shares sold per aircraft, and by drawing upon charter aircraft. The core fleet, as previously discussed, is a number of aircraft that are held in reserve and in which shares are not sold (Norris, 1999). Although the number of shares per aircraft varies from one provider to the next, the shares to aircraft ratio as of November 1999 was estimated at 5.2 (Lowe, 1999, November). When charter services are called upon to support a fractional provider's commitment to a shareholder it is called "backup lift". Backup lift results when a fractional provider is not able to support a customer with their shared aircraft, with another aircraft in the dry lease arrangement, or an aircraft from the core fleet. In these situations the fractional provider will "go to" a previously qualified charter-management service to provide the flight services required (Pope, 1998). Backup lift is an essential facet of fractional ownership. Gevalt (as cited in Gleimer, 1999), states that backup lift provides 17-18% of the hours flown in fractional ownership programs.

Fractional ownership programs provide a unique option for companies and individuals that have a need for air transportation. The aircraft type and share size is based on personal or business needs (Gleimer, 1999). Fractional ownership offers all the usual financial benefits of owning capital equipment plus a unique benefit in that the terms of the fractional agreement typically guarantee the liquidity of the investment. An aircraft is always available and there are no management or operational issues with which to contend (Collins, 1998). A fractional share offers an effective and efficient means of air transportation, with costs directly proportionate to utilization.

Those companies or individuals best suited for fractional ownership are determined primarily by their forecasted annual aircraft utilization rate. The range of annual aircraft utilization is wide. As indicated by Table 2, the average of the ranges from the various authors indicates an overall range of usefulness for fractional ownership between 145

and 387.5 hours of annual flight time.

An early estimate for fractional ownership was a utilization rate between 70 and 400 hours annually (Bradley, 1995). An annual utilization rate "rule of thumb" indicates that: (a) charter service is best when annual utilization is less than 100 hours, (b) fractional ownership is best when annual utilization is between 100 and 400 hours, and (c) total ownership is best when annual utilization is above 400 hours (Bradley, 1996). A broader estimate for fractional ownership supported an annual utilization rate between 100 and 500 flight hours (Smith, 1997). One Fortune 500 corporation estimates that an annual utilization rate: (a) below 250 hours justifies a charter service, (b) between 250 to 400 hours justifies a fractional share, and (c) in excess of 450 hours justifies a wholly owned aircraft (Thurber, 1997). A number of factors affect the point at which fractional ownership will cost less than a wholly owned aircraft as de Decker (1999) states:

While that point is different for each aircraft, our experience shows that it occurs somewhere between 250 and 400 hours. Overstaffing, expensive facilities, excessive spare parts inventories and inadequate management will make fractional ownership less expensive at much higher utilizations. (p. 119)

Any one of these estimates is not a precise indicator of which type of service is best in all cases. The choice is not based solely upon annual utilization rates. However, the formula for determining which service is best is affected by a number of factors: (a) route structure, (b) daily round trips, (c) extended stay one-way trips, (d) fixed or variable passenger capacity, (e) demand for multiple aircraft, (f) new or used aircraft, (g) positioning or deadhead legs, and (h) owner status (no flight department or an existing flight department). When these factors and the costs for daily minimums, overnights, crew expenses, landing fees, and catering have been accounted for, fractional ownership is found by one source to be cost effective in the 100 to 225 occupied flight hour per year range (Phelps, 1999, April).

The Evolution of Fractional Ownership

Table 2

Fractional Aircraft Ownership Annual Utilization Rate Range of Usefulness

Source	Hours per Year		
Bradley (1995)	70	to	400
Bradley (1996)	100	to	400
Smith (1997)	100	to	500
Thurber (1997)	250	to	400
de Decker (1999)	250	to	400
Phelps (1999)	100	to	225

Note. From these six sources an annual range of usefulness for a fractional share is estimated between 145 hours to 387.5 hours.

For comparison, to justify establishing a new flight department to support a corporate aircraft, the annual utilization rate should be forecasted between 350-400 hours at a minimum (Esler, 1998). An existing flight department, one with operational and support resources already established, should have a forecasted annual utilization rate around 250 hours (Esler, 1998). In either case, however, purchase of a used aircraft instead of a new aircraft can reduce the annual utilization rate estimate by as much as 100 hours (Bradley, 1996). For example, another estimate states that when annual utilization rates exceed 320 hours, the purchase of a used aircraft may be justified and an annual utilization rate over 450 hours, may justify the purchase of a new aircraft (McLaren, 1996). And, as is the case with a new aircraft, the decision to buy a used aircraft is not predicated solely upon forecasted annual utilization

rates as shown in Figure 1. The used aircraft procurement evaluation must also take into consideration the costs associated with maintaining aging airframes, powerplants, associated systems, and noise abatement (Chandler, 1997). See Table 1 for a comparison of new to used costs of fractional aircraft shares.

Helicopters are being brought into the market as well; with Bell ("Bell Helicopter Moves," 1999) and Sikorsky ("Sikorsky to Offer," 1999) helicopter companies representing the rotary-wing component.

Corporate aviation as a mode of travel is not inexpensive, however fractional ownership has made a major contribution in significantly lowering the up-front costs of business and corporate aircraft. The fractional ownership aircraft purchase price, makes corporate aircraft ownership them available to larger numbers of users (Bradley, 1996)

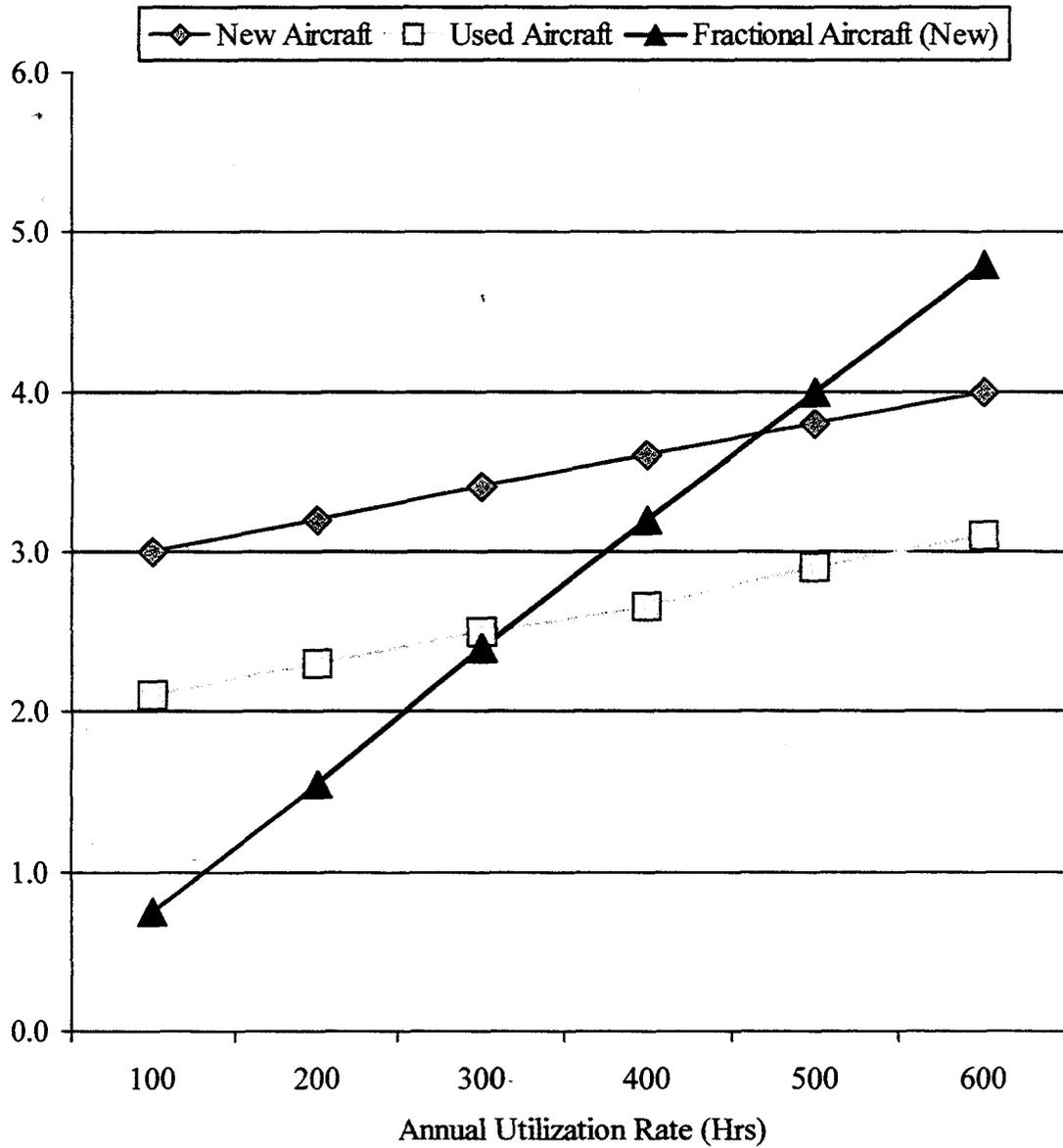


Figure 1. Estimated Costs of a Totally Owned (New or Used), and a Fractional Share (New) Light Jet. Chart is adapted from Keith (1998).

The Evolution of Fractional Ownership

Growth

NetJets, the original fractional ownership program, began operations in 1987 with eight Cessna Citation S/II's augmented with a core fleet of aircraft. In 12 years this company has burgeoned into a fleet of 205 airplanes, 1,350 shareholders, and \$9.75 billion of aircraft on order ("Executive Jet Orders," 1999). In a 1999 report Lowe states that:

In the past three-and-a-half years, Executive Jet ordered 600 new aircraft-at a cost of \$10 billion-for the NetJets program, which represents almost 40 percent of the business jet outputs from Boeing, Cessna, Dassault Falcon, Gulfstream and

Raytheon. (p. 50)

Bombardier's Flexjets and Raytheon's Travel Air fractional programs a plethora of other organizations, large and small, offering new and used aircraft, have also contributed to the growth of the fractional ownership segment of general aviation. Figure 2 illustrates the immense growth in fractional shares sold from 1990 to 1999.

Seidanman and Spanovich estimate that fractional ownership is growing at an annual rate of 50% (1998). With exception of the four-year period 1989-1993, fractional ownership has grown at 50% per year since 1987 (Lowe, 1999, March).

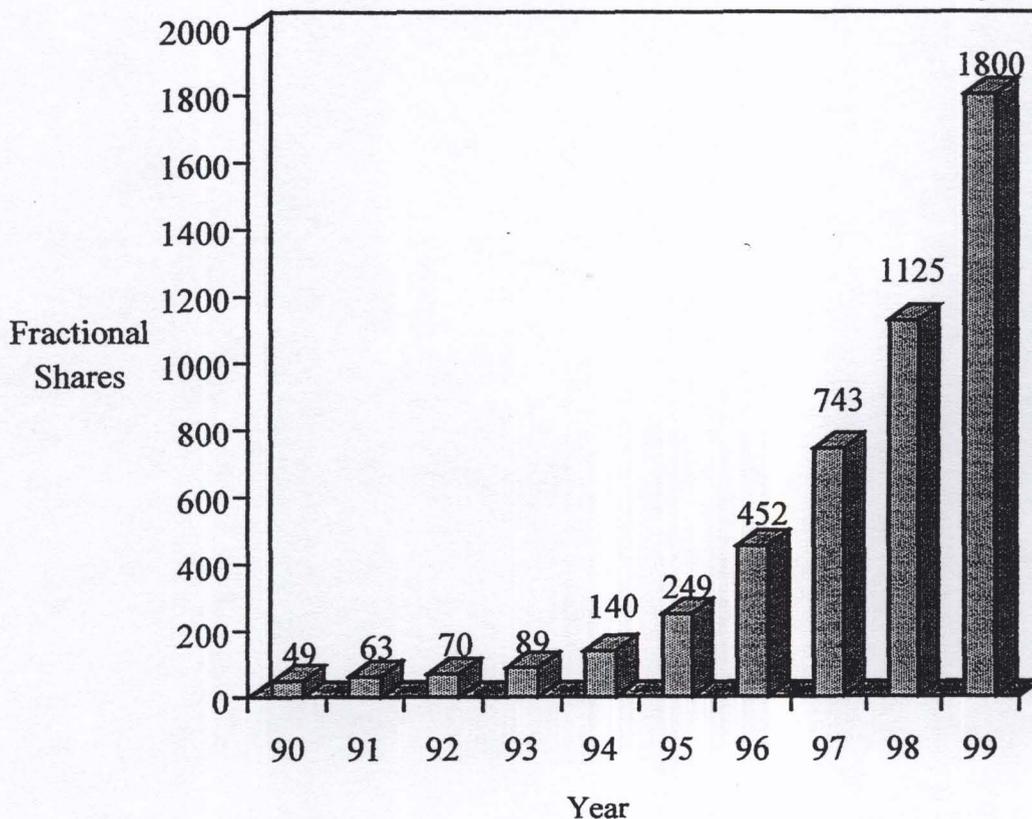


Figure 2. Fractional Shares Sold (by the Leading Fractional Aircraft Providers). Data from 1990-1998 from AvData, Inc., Wichita, KS, 1999 as cited in The NBAA fleet: Fractional ownership (1999, p.12). Data for 1999 extracted from Regulation of Fractional Aircraft Ownership Programs (2000, February 23).

The cumulative effect that fractional ownership has had on general aviation is nothing less than phenomenal. The vibrant U.S. economy, the General Aviation Revitalization Act of 1994, and fractional ownership have been cited for the continuous growth of general aviation (Lowe, 1999, March). Fractional ownership accounts for 15% of all new business jet deliveries ("Fractional ownership programs," 1999). Firm orders placed on behalf of fractional providers' account for an even larger percentage of the business jet manufacturers' backlog. This growth stimulates fuel sales, charter activity, and employment (Lowe, 1999, March). Figure 3 provides a graphic representation of this growth. In reference to fractional ownership as a "robust industry full of opportunity," the Dallas Business Journal went on to estimate a customer base of 110,000 individuals and 150,000 companies with the financial potential to secure a share in a private, or business/corporate aircraft (Padfield, 1998).

Financial potential is based upon an individual's or a company's annual income/revenue at \$10 to \$30 million respectively. The largest of the fractional providers uses this "target market" and estimates there are 120,000 individuals and 120,000 companies in this range (Moll, 1999). "Only a small percentage of this potential market has been developed to date" (Gilbert, 1998, p. 30). More recently market penetration has been estimated at around 5%, with approximately 200,000 potential customers in the U.S. (Lowe, 1999, November).

By reducing up front acquisition costs of an aircraft by as much as 88% ("Growth Surge," 1999), fractional ownership has not only broadened the base of potential customers but it has also redefined them. A majority of these buyers have not previously chartered, or owned, and in some instances they have never flown on a private or a business/corporate aircraft. Estimates from fractional providers indicate that 70% (Silitch, 1998) to 80% (Norris, 1999) of their customers are "new" or "concept" buyers. These numbers have been challenged. Gevalt (as cited in Padfield, 1998), has determined that 57% of fractional shareholders had chartered before and an additional number were previous aircraft owners. He estimates that as much as 70% of present fractional aircraft shareholders had chartered or owned aircraft previously.

Fractional providers are well established in the United States and have gained a foothold in Europe. Although growth in Europe has not been as meteoric as in the US, this is due to a number of difficulties. These difficulties

include Europe's fragmented legal and fiscal structure as well as a corporate culture that differs as much from the US as it does from one European country to another (Alcock, 1999). Two of the U.S. fractional providers are operating in Europe and several European organizations have started fractional ownership programs as well. The US and European fractional providers offer a variation of the fractional ownership program offered in the US (Walters, 1999).

The next region of expansion is the Middle East. Although estimates of being established there varied, from as early as the second quarter of 1999 ("Late News", 1998), to no later than the first quarter of 2000 (Alcock, 2000), fractional shares officially became available in the Middle East in October 1999 (Alcock, 2000).

South America and the Pacific Rim are on the drawing board. These areas pose unique difficulties in the form of longer stage lengths that require larger, longer-range aircraft and, therefore, greater capital investment (Phelps, 1997). Fractional providers should be further encouraged by a comment made at Air Show China '98. Wu Zhendong of Avion Pacific, Ltd. believes fractional ownership would speed the development of business aviation in China, "I wish Richard Santulli [Chief Executive Officer of Executive Jet Aviation that owns NetJets] were here to give a speech about NetJets' successful operations in the U.S.A." (Phelps, 1999, January, p. 57).

The General Aviation Manufacturers Association (GAMA) celebrated its fifth consecutive year of growth with billings in 1999 of \$7.9 billion. This reflects a 35.1% increase from 1998 numbers. Suma (as cited in Lynch, 2000), estimates that billings would be nearly \$10 billion for 2000, predicated upon 1999 increases. Other indicators of the industry cited by GAMA president Ed Bolen were: a three percent increase in the pilot population, an additional 500 corporate flight departments, 50% increase in fractional ownerships, and 20% increase in charter activity (Lynch, 2000).

COMPARATIVE ANALYSIS

The Airlines

The inconvenience of having to meet a predetermined schedule, with a fixed route structure, with limited numbers of locations served, compounded by the time it takes to check in, make connections, enplane, deplane, retrieve luggage, and secure ground transportation has driven many to consider other means of air travel (Agur, 1999). The airlines provide a bona-fide service to the business traveler

The Evolution of Fractional Ownership

that is timely, highly reliable, and safe. However, when time is money, when the cost of travel is overshadowed by the magnitude of the deal, a private or business/corporate aircraft is essential.

Commercial air carriers serve approximately 550 airports, whereas general aviation aircraft can operate in and out of about 5,500 (Cook, 1998). This is an area where the use of private or business/corporate aircraft can save considerable travel time through direct access to the final destination. With the air carrier's hub-and-spoke route structure, making connections, and traveling within the confines of a prescribed schedule, a one-day trip can easily be extended to two or more (Stagnaro, 1997).

Wholly Owned Aircraft

Total aircraft ownership represents the most expensive mode of private or business/corporate travel. Unless 400 hours or more are flown annually it is difficult to justify total aircraft ownership (McLaren, 1996). Yet, ¾ of all NBAA members operate wholly-owned aircraft according to a 1998 membership survey.

Aircraft owners are responsible for all operational requirements and regulatory compliance associated with aircraft operations. Initial aircraft acquisition, cost of establishing and maintaining a flight department, cost of maintenance and repair of aircraft and associated equipment are in the millions even for the smallest corporate jet. Based upon the 1998 NBAA survey, "...the average flight department budget for 1997 was \$2.5 million" ("National Business Aviation Association," 1998, p. 27). Flight departments may range in size from a single individual outsourcing everything except the aircraft to multiple aircraft and a complete staff of pilots, mechanics, flight attendants, dispatchers, managers, administrators, and a variety of support personnel. In addition to flight services and maintenance, a flight department's responsibilities may include, but not be limited to: hiring, training, scheduling, dispatching, catering, administrating, and accounting. Flight departments are tailored to meet the specific and unique operational requirements of the aircraft owner (Benenson, 1998). The cumulative effect is that aircraft ownership is too expensive for some individuals, businesses, and corporations that might otherwise benefit from their use (Moll, 1998).

Total ownership is more advantageous the more the aircraft is used. The more an aircraft is flown on an annual basis, the lower its operating costs (de Decker, 1999). With total ownership there are no additional costs for going over

a contracted limit. In fractional ownership arrangements the time allotted is limited in advance by the size of the share as specified in the formal agreement; flight time in excess of the share allocation results in additional costs (de Decker, 1999). Accruing equity and retaining complete control of the asset, while simultaneously enjoying the tax benefits of depreciation, are additional benefits of total ownership (Gilbert, 1999, August). Total ownership also allows for operations under the more flexible FAR Part 91 General Operating and Flight Rules an advantage currently shared by fractional ownership (Title 14, CFR, 1998).

In recent years, total aircraft ownership has become increasingly attractive due to low interest rates and by the high resale value of most turbine powered aircraft. The recent demand for pre-owned turbine aircraft has resulted from: (a) dissatisfaction with the airlines, (b) reduced availability of charter aircraft, (c) fractional owners wanting their own aircraft, (d) original equipment manufacturer backlog, and (e) consumer demand for an "instant airplane" (Harrison, 1999, August). This, along with the absence of pre-payment penalties on aircraft loans, has made it less of a risk if the company needs to liquidate the asset. Also, long-term ownership can result in recovering most of the original investment (Harrison, 1999, August).

Charter Services

Charter services, as defined by Gilbert (1999, August), are "A company that provides aircraft and crew to the general public, for compensation or hire" (p. 37). Charter, sometimes referred to as "air taxi," is an excellent means of air transportation. Customers pay only for what they need. Charter customers, and fractional owners alike, are less sensitive to operational costs. Charter companies typically provide quotes on what a trip will cost and customers decide whether or not this is in their best interest. To arrange for flight services, charter customers make contact with a charter operator or an aircraft management company. The number of contacts may vary with their flight requirements. It is not unusual for charter customers to "shop around" for the best deal, compatibility, and quality of service. Shopping around may also be required to find a particular charter service to meet a specific transportation requirement. Conversely, fractional owners make contact with the same organization time and again, receiving predetermined services and amenities from an organization they are accustomed to dealing with (Esler, 1998).

Fractional ownership also allows the owner a tax deduction for depreciation of a capital asset (Bradley, 1995), not so for the charter customer. Charter customers can expect to pay for deadhead legs, layovers, and many other costs previously discussed, none of which is an itemized cost for fractional owners. This fact alone can mean significant savings for fractional owners (Collins, 1998).

On the other hand, charter customers pay nothing if they are not using the aircraft. There is no down payment or monthly management fee. There is a tremendous variety of charter aircraft available to suit whatever needs an individual or a company has. Historically, a charter could be arranged 7 days a week, 24 hours a day, with response times within 90 minutes. According to Baldwin however, charter availability today is not what it once was, "...today to get a charter, it is extremely difficult to get commitments and find available airplanes.... Ironically, all the better charter operators are tied up supporting the fractional companies." He goes on to say, "it took eight weeks to set up two charter flights planned for the following week" (Esler, 1998, p. 68).

Backup lift provided to fractional ownership companies,

as previously discussed, provides nation's the charter services with substantial revenue. In 1997, 17,000 flight-hours, with \$40 million in revenue, for backup lift was purchased by fractional providers; with an estimate for a 20% increase over the next two years (Pope, 1998). Executive Jet estimates that in calendar year 2000, they will require approximately 30,000 flight-hours of backup lift support reflecting a 22.5% increase (Infanger, 2000). Backup lift support is not the only form of flight services that charter operators provide to fractional providers. When faced with the inevitable aircraft on the ground (AOG) a fractional provider must respond immediately. Response to an AOG situation is frequently more readily facilitated by a charter organization. Getting flight crews, technicians, tools, and parts to the disabled aircraft as quickly as possible is essential to the fractional provider (Smith, 1997). Therefore fractional ownership has stimulated significant air charter business in the past with future indicators exceeding expectations. See Table 3 for advantages and disadvantages of total/fractional ownership and charter service options.

The Evolution of Fractional Ownership

Table 3

Advantages and Disadvantages of Aircraft Ownership/Charter Service

Criteria	Wholly-Owned	Fractional	Charter
Total Control and			
Crew Familiarity	Yes	No	No
Level of Service	Highest	Excellent	Varies
Response Time	Excellent	Guaranteed	No Guarantee
Upgrade	Yes	Yes	N/A
Downgrade	Yes	Yes	N/A
Sell	Yes	Yes	N/A
FAR Part 135			
Cost Offset Option	Yes	No	No
Capital Outlay	High	Low	None
Aircraft Availability			
(Back up/Multiple)	No	Yes	No
Deadhead Costs	Yes	No	Yes
Guaranteed Fixed Costs	No	Yes	No

Criteria	Total	Fractional	Charter
Variety of:			
Aircraft	No	No	Yes
Services	No	No	Yes
Flexibility	No	No	Yes
Federal Excise Tax	No	Yes	N/A
Liability Issues	Yes	Yes	No
Residual Value	Highest	Lower	No
Depreciation Tax Benefits	Yes	Yes	No

Note. N/A indicates that information was not available. Table was compiled from data available from National Business Aviation Association (2000, p. 27).

CHALLENGES FACED BY FRACTIONAL OWNERSHIP PROGRAMS

Fractional ownership will be affected primarily by two factors. The first and perhaps the most complex is the global economy. The aviation industry is a direct reflection of global economic factors. When economies are strong and thriving people travel for pleasure and for business. With interest rates at a three-decade low and Wall Street operating at record highs (Harrison, 1998) the aviation industry is thriving. As a result, large numbers of private individuals and business travelers are in a continuous state of motion utilizing the airlines, corporate flight departments, charter-management services, and fractional ownership for their transportation needs. The first quarter of the new millennium has seen a dramatic increase in the price of fuel, interest rates have risen moderately, and the Dow Jones and the NASDAQ indexes have provided investors with a three month long roller coaster ride. When and to what extent this will affect fractional ownership is unknown.

How the FAA decides to regulate fractional ownership is the second factor affecting the future of fractional ownership. This is the most volatile factor of the two, not only for fractional ownership but also for general aviation as a whole. Will the FAA continue its hands-off policy, allowing fractional ownership to be regulated by FAR Part 91, and thereby encourage the industry to regulate itself? The president of the National Air Transportation Association (NATA) states, "We think the FAA should deregulate and allow self-regulation.... My vision is that FAA hand over more of its responsibilities to the aviation community" (Thurber, 1998, pp. 92, 93). Or as Bradley more succinctly puts it, "...less is more" (1998, p. 10). According to some an Advisory Circular, providing guidance to compliance for fractional providers within the scope of existing regulations, would suffice (Harrison, 1999, March). Or will the FAA take a stronger approach?

The basic controversy surrounding fractional ownership is which regulation is best suited for their operations. Fractional ownership does not clearly fit into either FAR Parts 91 or 135. What is clear is that fractional providers enjoy an excellent safety record to date (See Table 4), and that fact alone speaks volumes in favor of leaving fractional ownership within FAR Part 91 (Holahan, 1998). According to Moeggenberg (as cited in Lowe), since 1986 the fractional fleet has logged over 776,000 hours, flown over 300 million miles, with no fatalities recorded to date (1999,

November). Only the scheduled air carriers have a better accident rate. Through 1999 three accidents were attributed to fractional ownership and again no fatalities were recorded (Gilbert, 2000). Fractional ownership providers believe that they fall under the auspices of FAR Part 91 General Operating Flight Rules, Section 501. Charter companies, and many aircraft management companies, believe that fractional ownership providers must comply in total with the more restrictive FAR Part 135 Air Taxi and Commercial Operators (Padfield, 1998).

The controversy stems from the two major benefits of operating under FAR Part 91: waivers of crew duty, flight and rest time limitations and less restrictive airport access. The qualification for operating under FAR Part 91 is that the aircraft is not for hire ("Title 14," 1998). In other words the owner is flying on the aircraft. Charter operators on the other hand always fly for hire and therefore must comply with the more restrictive and consequently more costly FAR Part 135. Operations under FAR Part 135 are more costly because an organization must have more pilot resources available to comply with more restrictive crew duty, flight time (120 hours per month) and rest time limitations. These limitations are not imposed by FAR Part 91 (Lowe, 1999, February). Under FAR Part 135 a flight into an airport requires that the aircraft be capable of a full stop landing within 60% of that airport's effective runway length. Additionally, the airport must have "on-site" weather reporting capability for flights conducted under Instrument Flight Rules (Padfield, 1998). Here again FAR Part 91 does not have these restrictions and, therefore, aircraft operating under FAR Part 91 have significantly greater flexibility than operations conducted under FAR Part 135 (Padfield, 1998). Approximately 550 airports in the United States meet the requirements of Part 135 commercial aircraft service. There are approximately 5,500 airports that meet the requirements of FAR Part 91 business aviation operations ("NBAA News," 1999, p. 12). Each of the three largest fractional ownership companies register their aircraft on FAR Part 135 certificates. In so doing their aircraft must be equipped and maintained accordingly, all of the time. However, unless the aircraft is flown "for hire," an aircraft registered on a FAR Part 135 certificate is not required to be flown in accordance with FAR Part 135 and may be flown in accordance with FAR Part 91. Such is the case when an aircraft is flown for a fractional owner, or in a Part 135 operation when no passengers are on-board (Padfield, 1998).

The Evolution of Fractional Ownership

Table 4

Aircraft Accident Rates, 1990-1998 (per 100,000 flight hours)

Year	General Aviation *	Air Taxi **	Major Carrier ++	Corporate Executive #	Business ###	Fractional
	Total/Fatal	Total/Fatal	Total/Fatal	Total/Fatal	Total/Fatal	Total/Fatal
1990	7.77/1.55	4.76/1.29	0.198/0.049	0.21/0.09	3.71/0.96	0/0
1991	7.85/1.56	3.93/1.25	0.221/0.034	0.23/0.08	3.08/0.82	0/0
1992	8.36/1.80	3.86/1.22	0.146/0.032	0.21/0.08	2.17/0.68	0/0
1993	8.94/1.74	4.16/1.15	0.181/0.008	0.23/0.07	2.02/0.52	0/0
1994	8.96/1.81	4.58/1.40	0.168/0.030	0.18/0.07	1.81/0.51	0/0
1995	8.23/1.64	4.39/1.41	0.267/0.022	0.25/0.11	2.04/0.67	0/0
1996	7.66/1.45	4.44/1.43	0.276/0.036	0.14/0.06	1.71/0.34	0/0
1997	7.29/1.40	3.64/0.67	0.310/0.025	0.23/0.06	1.41/0.39	0/0
1998(P)	7.12/1.35	3.11/0.67	0.291/0.006	0.091/0	1.14/0.30	2/0

Note. * is all U.S. registered civil aircraft not operating under FAR Part 121 or 135. ** is FAR Part 135 nonscheduled air carriers. ++ is FAR Part 121 scheduled and nonscheduled air carriers. # is aircraft owned or leased and operated by a corporation or business firm for the transportation of personnel or cargo in furtherance of the corporation's or firm's business and which are flown by professional pilots receiving a direct salary or compensation for piloting. ## is the use of aircraft by pilots (those not receiving direct salary or compensation for piloting) in conjunction with their occupation or in the furtherance of a business. P is preliminary. Adapted from National Business Aviation Association (2000, p. 27), and Gilbert (2000).

In September of 1998, FAA Administrator Jane Garvey requested the NBAA to submit recommendations for the regulation of fractional ownership in the context of safety and oversight of their operations. The NBAA, in consort with the GAMA and the NATA responded by providing the FAA with "Safety Guidelines & Responsibilities for Fractional Aircraft Owners and Fractional Aircraft Program Managers" (Lowe, 1999, February, p. 18). In the transmittal letter to the FAA these three aviation organizations identified Part 91 as the appropriate medium to sufficiently monitor safety issues and provide the FAA with ample authority to ground aircraft, deny privileges, and suspend operations (Lowe, 1999, February). In a related article Collogan (as cited in "GAMA & NBAA Support"), stated that the GAMA and the NBAA both strongly recommend that fractional operations continue to be regulated by FAR Part 91 as a result of their excellent safety record and their contribution to revitalizing the industry (1998). The FAA received these recommendations in January 1999 (Lowe, 1999, April). To further emphasize the complexity of the controversy it is important to note that the NATA, having participated in development of the safety guidelines, submitted a letter to FAA to clarify its

position on this issue. The NATA's concern was based upon compliance with the safety guidelines as a condition for NBAA membership. The NATA is not concerned with NBAA membership and states in their letter: "...the guidelines should be a 'basis for policy to evaluate fractional aircraft ownership programs to determine the appropriate regulatory oversight'" (Gilbert, 1999, September, p. 66).

The FAA took no action on the GAMA, NATA, and NBAA safety guidelines and responsibilities. Then on October 6, 1999, FAA Administrator Jane Garvey established the Fractional Ownership Aviation Rulemaking Committee (Padfield, 2000). The objective of the FOARC was "propose such revisions to the Federal Aviation Regulations and associated guidance material as may be appropriate with respect to fractional ownership programs" ("Regulation of fractional aircraft programs," 2000). The FOARC recommendations, briefly summarized: (a) define fractional ownership, operational control and responsibility for regulatory compliance, a program managers safety responsibilities, FAA fractional program oversight and enforcement, and the parameters of the FAA issued "management specifications"; (b) provide for the continued

operation of fractional programs and traditional flight departments under Part 91; and (c) determine how Part 135 should be modernized (Lowe, 2000, April). Should these recommendations be adopted verbatim, fractional ownership providers will be regulated under the proposed FAR Part 91 Sub-part K. The most significant change would be crew, duty and flight time restrictions and competition from a renewed charter service industry with equal access to the nations airports.

THE FUTURE

Although the aviation industry does take considerable advantage from a thriving economy, it provides a considerable return to it as well. The airlines are buying airliners and the business aircraft market, new and used, is brisk (Harrison, 1999, August). Productivity gains bolstered by general aviation aircraft and forecast increases in business aircraft purchases, exceeding 100 units per year, stimulates fleet growth and utilization well into this century (McDougall, 1998/1999). Business aviation is forecast to expand at a more rapid pace than personal use of general aviation aircraft through 2010 due to the growth of fractional ownership (Department of Transportation [DOT], 1999, p. I-16). This DOT forecast, continues with:

The Allied Signal Business Aviation Outlook [italics added] forecasts delivery of 6,500 business aircraft over the 1999 to 2009 time period. This is up 1,200 over their previous forecast. The increased numbers result from record back orders, the strong U.S. economy, fractional ownership growth at double digit rates, and interest in new models. The Teal Group released lower but still optimistic forecasts of 4,100 jets over the 1998-2007 period. (p. V-11)

The FAA's response to the FOARC' recommendation is the key to the future of fractional ownership programs. The FOARC went to great lengths, and was ultimately successful, in gathering a unanimous consensus regarding how fractional ownership should be regulated (Lowe, 2000, February). The most significant impact of the FOARC's recommendation stems from the root cause of the fractional ownership vs. charter services controversy; airport access and crew, flight and duty time (Padfield, 1998). If the recommendations are incorporated, as they were submitted, the playing field will be leveled regarding airport access and crew, flight and duty times, for fractional operations and charter services. The result will be more direct competition from charter services.

CONCLUSIONS

This paper reveals three key findings regarding fractional ownership. The first is that a range of usefulness or annual utilization rate (hours flown per year) for charter services, fractional ownership, and total aircraft ownership has

evolved. According to the data provided by six authors this range is between 145 and 387.5 hours of annual flight time. This range of usefulness has defined a niche market for each of these three means of business aircraft transportation. Charter services, fractional aircraft providers, and corporate flight departments are interdependent entities. In fact, the findings demonstrate that any one of the three has a use for either or both of the other two through aircraft management services, backup and supplemental lift.

The second finding of this paper is that fractional ownership has redefined the business aircraft consumer. By significantly reducing the up-front cost of owning an aircraft, fractional ownership has found a customer base that has heretofore been untapped. The target market for a fractional share is an individual with annual income of \$10 million or company with annual revenue of \$30 million. One fractional provider estimates that there are over 100,000 potential fractional owners in each category, the majority of which have never used a business aircraft (Lowe, 1999, November).

The third finding of this paper deals with the commercial and economic impact that fractional ownership programs are having on the general aviation industry. The number of aircraft in fractional ownership programs has grown from eight in 1987 to, what the FOARC could at best "approximate", was a fleet of 450 aircraft, 1800 shareholders, and 500 flights per day ("Regulation of fractional aircraft programs," 2000, February 23). This is equivalent to a growth rate of roughly 34 aircraft per year. In 1996, GA manufacturers billings topped \$3 billion for the first time. General aviation has recently posted its fifth consecutive year of growth. The GAMA reports this is a first time occurrence since that organization began tracking these numbers 54 years ago.

More aircraft, more flight-hours means more: fuel; maintenance, parts, and service; training; catering; and employment opportunity. The multiplier effect that fractional ownership has had on general aviation has resulted in an industry operating at capacity; with a projected demand to keep it there for several years to come (Lowe, 1999, March). With a projected customer base of 200,000 individuals/companies, in the US alone, having the financial potential for a fractional share a mere five percent of this market has been penetrated to date (Moll, 1999). Satisfying this demand for business jet transportation, with a totally owned aircraft, a fractional share of an aircraft, or with a charter service, will continue to drive a prosperity in general aviation that it has not experienced to date.

Fractional ownership will continue to extend the advantages of private and business/corporate aircraft to greater numbers of individuals, businesses, and

The Evolution of Fractional Ownership

entrepreneurs. Fractional providers will continue to place a demand on charter-management operations for back-lift support and their supplemental support of flight departments shows no signs of decline. As fractional ownership continues to proliferate, the natural forces of competition will drive costs down and drive less

competitive organizations, charter services, flight departments, and fractional providers as well, out of the picture. Fractional ownership of helicopters and smaller aircraft will potentially have the same effect on these segments of general aviation as the big three fractional providers have had on the business jet segment. □

D. Scott Worrells earned a Master of Science in Aviation Management, a Bachelor of Science in Aviation Technology-Avionics, and a Associate of Science in Aviation Maintenance Management from Embry-Riddle Aeronautical University. He is an Assistant Professor, Department of Aviation Management and Flight at Southern Illinois University Carbondale.

David A. NewMyer earned a Master of Arts in Metropolitan Studies from Drew University, a Master of Science in Transportation from Northwestern University, and a Ph.D. in Education Administration and Higher Education from Southern Illinois University Carbondale. He is an Associate Professor and Chairperson, Department of Aviation Management and Flight at Southern Illinois University Carbondale.

Jose R. Ruiz earned a Master of Aeronautical Science from Embry-Riddle Aeronautical University; a Bachelor of Science in Human Resource Management from Park College. He is an Assistant Professor, Department of Aviation Management and Flight at Southern Illinois University Carbondale.

REFERENCES

- Agur, P. (1999, April 26). Business aviation: It's about time. *Forbes*, 139, 51-59.
- Aircraft resourcing options. (1999). *National Business Aviation Association*. Retrieved January 30, 1999 from the World Wide Web: http://www.nbaa.org/resourcing/pros_cons.htm.
- Alcock, C. (2000, January). NetJets frax ops make their mark in the Middle East. *Aviation International News*, 32, 48.
- Alcock, C. (1999, November). The Europeans: A very different market. *Aviation International News*, 31, 54.
- Bell Helicopter moves into fractional arena. (1999, June). *World Aircraft Sales*, 3, 66.
- Benenson, T. (1998, November). Owner/Operator: Gulfstream/Pentastar team on management. *Flying*, 126, 62.
- Bradley, P. (1998, November). Part 91 is the best place for shared ownership: Changing the regulatory framework fixes a problem that doesn't exist. *Business and Commercial Aviation*, 83, 10.
- Bradley, P. (1996, November). Fractionals: Friend or foe? *Business and Commercial Aviation*, 79, 76-80, 82.
- Bradley, P. (1995, January). A piece of the pie. *Business and Commercial Aviation*, 76, 60-64.
- Chandler, J.G. (1997, November). Safety and new technology: Aging gracefully. *Aviation Maintenance*, 16, 18-22.
- Collins, R. L. (1998, November). ExecutiveJet: Buy a piece of the Netjets action. *Flying*, 126, 95-98.
- Conklin and de Decker. (1999, Spring). Fractional ownership. In *The aircraft cost evaluator: Turboprops* (28th ed.) (pp. F1-4). Orleans, MA: Paraclete Press.
- Cook, B. (1998, May-June). How about your own aircraft fleet? *Airport Magazine*, 10, 18-21, 75.
- de Decker, B. (1999, April). CEOs and CFOs are fascinated with fractionals: To compete, the traditional flight department must become more cost effective. *Professional Pilot*, 33, 118-120, 122.
- Department of Transportation: Federal Aviation Administration. (1999). *FAA aerospace forecasts: Fiscal years 1999-2010*. (FAA-APO-99-1). Washington DC: Author.
- Esler, D. (1998, November). Using fractionally owned aircraft for supplemental airlift. *Business and Commercial Aviation*, 83, 66, 68, 70, 72, 74.
- Executive Jet: History at a glance. Retrieved from the World Wide Web at <http://www.netjets.com/findex.html>. Accessed on April 10, 2000.
- Executive Jet orders 50 Horizons, takes orders on 50 more in \$2 billion deal. (1999, June 14). *The Weekly of Business Aviation*, 68, 269.
- Fractional ownership programs have grown 50 percent per year. (1999, February 15). *The Weekly of Business Aviation*, 68, 72.
- GAMA and NBAA support Part 91 for fractionals. (1998, November). *Business & Commercial Aviation*, 83, 37.
- Gilbert, G.A. (2000, February). Turbine accidents rose to near-high last year. *Aviation International News*, 32, 4.
- Gilbert, G.A. (1999, September). NATA issues revision of its fractional guidelines. *Aviation International News*, 31, 66.
- Gilbert, G.A. (1999, August). The new faces of business aviation. *Aviation International News*, 31, 34-37.
- Gilbert, G.A. (1999, April). Baron/Bonanza fractional program off the ground. *Aviation International News*, 31, 10.
- Gilbert, G. A. (Ed.). (1998, November). GAMA and NBAA support Part 91 for fractionals. *Business and Commercial Aviation*, 83, 30.
- Gleimer, E.M. (1999, Fall). When less can be more: Fractional ownership of aircraft-the wings of the future. *Journal of Air Law & Commerce*, 64, 979-1032.
- Growth surge for NetJets program. (1999, June). *World Aircraft Sales*, 3, 12, 14, 15.
- Harrison, K. J. (1999, December). Do the math: Fractionals are pricier than in-house, FMC manager claims. *Aviation International News*, 31, 25 & 26.
- Harrison, K. J. (1999, August). Pre-owned turbine aircraft. *Aviation International News*, 31, 54-57.
- Harrison, K. J. (1999, July). Completions & refurb. *Aviation International News*, 31, 42-46, & 48.
- Harrison, K. J. (1999, March). NATA differs on frax issue. *Aviation International News*, 31, 50.
- Harrison, K. J. (1998, July). EJM offers jet owners a guaranteed profit. *Aviation International News*, 30, 4.
- Holahan, J. (Ed.). (1998, October). Executive jet buying spree boosts builders. *Aviation International News*, 30, 1.
- Infanger, J.F. (2000, January/February). EJ101: Executive Jet goes to class with suppliers to enhance overall service. *Airport Business*, 14, 26 & 27.

The Evolution of Fractional Ownership

- Jackson, K. (1999, June). Piggyback charter agreements: How to put your aircraft out for charter, without getting your own certificate. Business & Commercial Aviation, 84, 118.
- Keith, D. (1998, March). The state of business aviation: Fractional ownership. Proceedings of Federal Aviation Administration General Aviation Forecast Conference, Session 3, 121-139. Washington, DC: Government Printing Office.
- Late news as we go to press: Saudis approve NetJets Middle East plans. (1998, December). Aviation International News, 30, 3.
- Lowe, P. (2000, April). Frax rule draws muted reaction. Aviation International News, 32, 1, 18.
- Lowe, P. (2000, March). GA industry rides the high tide of prosperity. Aviation International News, 32, 50, 51.
- Lowe, P. (2000, February). Committee reaches unity of how to regulate frax. Aviation International News, 32, 3.
- Lowe, P. (1999, November). Fractionals: The players. Aviation International News, 31, 50-52.
- Lowe, P. (1999, March). GAMA: 1998 sales exceed \$5 billion, future is bright. Aviation International News, 31, 20.
- Lowe, P. (1999, February). NBAA says safety guidelines, not new regs, should control frax ops. Aviation International News, 31, 1, 18, 33.
- Lynch, K. (2000, February 14). GA posts fifth straight year of growth with \$7.9 billion in billings. The Weekly of Business Aviation 70, 71.
- McDougall, G. S. (1998/1999, December/January). Making sense of business aviation. Turbine & Twin, 2, 30-31.
- McLaren, G. (1996, August). The new trend toward fractional ownership: Manufacturers join with operators in offering shares of corporate jets. Professional Pilot, 30, 52-56.
- Moll, N. (1999, July). Horizon buy feeds EJA's vast appetite for new business jets. Aviation International News, 31, 1, 33.
- Moll, N. (1998, March). Fractional attraction: Time-share travelers discuss the allure of part ownership. Aviation International News, 30, 32, 34.
- NBAA news: Airport investment and access. (1999, July). World Aircraft Sales, 3, 12.
- National Business Aviation Association. (2000, April). Alert bulletin: Recommendation of the Fractional Ownership Aviation Rulemaking Committee (FOARC). Retrieved from the World Wide Web at <http://www.nbaa.org/member/abs/2000/00-02>. Accessed on April 15, 2000.
- National Business Aviation Association. (2000). The NBAA fleet: Business aviation fact book. Washington, DC: Author.
- National Business Aviation Association. (1998). Operator profile & benchmarking survey. Washington, DC: Author.
- Norris, R. (1999, February). Pitfalls of fractional ownership: Hidden risks exist in part-owner programs. Professional Pilot, 33, 96, 98, 100.
- Padfield, R. R. (2000, April). Commentary: FOARC: A model of industry-gov't cooperation. Aviation International News, 32, 2.
- Padfield, R. R. (1998, May). Part 91 or 135? FAA may narrow the choice.... Aviation International News, 30, 60, 62-63.
- Phelps, M. (1999, April). Fractionals aren't the only demon facing traditional flight departments. Aviation International News, 31, 29.
- Phelps, M. (1999, January). Chinese show disappoints, but reflects future promise. Aviation International News, 31, 57.
- Phelps, M. (1997, January). EJA reveals plans for additional growth. Aviation International News, 29, 6-8.
- Pope, S. (1998, April). American business rediscovers the charter solution. Aviation International News, 30, 28-32, 34.
- Regulation of fractional aircraft ownership programs: The recommendation of the Fractional Ownership Aviation Rulemaking Committee. (2000, February 23). Aviation International News/Online, 1-3. Retrieved from the World Wide Web at http://www.ainonline.com/march_recommendation.html on April 24, 2000.
- Searles, R.A. (1998, October). What's better than a private plane: A semi-private plane. Business & Commercial Aviation, 83, 62.
- Seidanman & Spanovich. (1998, October). Raytheon Travel Air's: First year includes explosive growth. Flying Careers, 3, 8-11, 13-17.
- Sikorsky to offer S-76 corporate helicopter through innovative fractional ownership plan. (1999, June). World Aircraft

Sales, 3, 68.

Silitch, M. (1998, November). AlliedSignal surveys good times. Aviation International News, 30, 62.

Smith, D. (1997, October). Fractional ownership: A maintenance perspective. Aviation Maintenance, 16, 34-37.

Stagnaro, F. J. (1997, April, 28). Fractional ownership: The only way to fly. The Business Journal, 1-3. Retrieved

January 14, 1999 from the World Wide Web:
<http://www.amcity.com/sanjose/stories/1997/04/28/focus1.html?h=fractionaljetownership#top>.

Thurber, M. (1998, May). FAA forecasters see a "new phase" of general aviation. Aviation International News, 30, 92-93.

Thurber, M. (1997, June). For Seagram, fractional buy is a natural. Aviation International News, 29, 22.

Title 14, Code of Federal Regulations. (1998). Aeronautics and space. Federal Aviation Regulations part 91 General Operating Flight Rules and part 135 Air Taxi and Commercial Operators. Office of the Federal Register, National Archives and Records Administration. Washington, DC: Government Printing Office.

Walters, B. (1999, December). \$65M Chauffair Share order for Excels is UK's biggest bizjet buy. Aviation International News, 31, 46.

