

PERSPECTIVES ARTICLES

RECENT DEVELOPMENTS IN THE AVIATION INSURANCE INDUSTRY

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ABSTRACT

The aviation industry has been hard hit in recent years. While there are numerous factors that have contributed to the industry's dilemma, rising and volatile insurance premiums—particularly after the events of 9/11—have posed a particular problem for many airline managers. Despite a general trend for accident rates involving commercial passenger airplanes to decrease as aviation technology has advanced over the years and airplanes have become safer, the aviation insurance market has been far from stable. This article provides an overview of how the aviation insurance industry works and how it has changed in recent years. We take a look at how the risk is spread between insurers, how insurers treat deliberate acts of violence, and lastly, how insurers price the risk. Our article shows that the aviation insurance market has undergone considerable changes in recent years and that it has adjusted to the post-9/11 aviation insurance realities being reasonably ready to handle events of an even more catastrophic magnitude.

INTRODUCTION

Aviation accidents, although infrequent, have the potential to result in large property damages and a high number of fatalities. The extant academic literature includes several

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studies that examine the strategic and financial consequences of aviation accidents for the affected airlines. Chance and Ferris (1987), Davidson et al. (1987), Walker et al. (2005), and Pukthuanthong-Le et al. (2007), for example, study the stock price reaction of airlines following an accident announcement.¹ In addition, Carter and Simkins (2004) and Flouris and Walker (2005) take a detailed look at the airline industry's reaction to the events of September 11, 2001 (9/11).² Yet, despite a thorough examination of the airline industry's reaction to aviation accidents that is provided by these strands of literature, there have been comparatively few studies that consider how insurance companies—which ultimately pay the bills—are affected. Our study adds to the existing literature in this area by exploring how the insurance industry has reacted to the events of 9/11.³

In the first part of our study we aim to provide insights into the inner workings of the aviation insurance market. Specifically, we take a look at how the risk is spread between insurers, how insurers treat deliberate acts of violence, and lastly, how insurers price the risk. The statistics and related discussions presented have been developed through cooperation with several industry insiders and should be of interest for both practitioners and academics alike. In the second part of the article, we focus our attention on the events of 9/11 and examine how they have affected both insurers and insureds.

We document that the aviation insurance market has undergone considerable changes in recent years that included, among other things, the withdrawal of numerous insurance policies immediately following the events of 9/11, the departure of several insurers and reinsurers from the aviation insurance market, the creation of a new drafting body for insurance clauses, the redrafting of several old insurance clauses to better address war and terrorism risks, the reformulation of previously designed disaster scenarios, and an active discussion among airlines, insurers, and governments about governments' role in insuring certain war risks. We will review and discuss each of these developments in detail in our article, and while many of them are still ongoing, it is fair to say that the insurance market has already sufficiently adjusted to the post-9/11 aviation insurance realities so that if worse comes to worst, it would be reasonably ready to handle events of an even more catastrophic magnitude.

THE AVIATION INSURANCE MARKET⁴

The fundamental principle of all forms of insurance is that “the premiums of the many will pay the losses of the few.”⁵ As insurance businesses exist in the commercial realm,

¹ For related research on the reputational consequences and legal repercussions of aviation disasters for airlines and airplane manufacturers, see also Chalk (1986, 1987), Borenstein and Zimmerman (1988), Mitchell and Maloney (1989), Rose (1992), and Bosch, Eckard, and Singal (1998).

² The hijacking of four aircraft and their subsequent deliberate crashing into the World Trade Center and the Pentagon, as well as the crash in rural Pennsylvania on September 11, 2001, is in short often referred to as “9/11.”

³ For other studies that examine changes in the aviation insurance market after 9/11, see Margo (2002, 2003), Abeyratne (2002, 2005), Kunreuther and Michel-Kerjan (2004), Caplan (2005a,b, 2006), and Hughes (2006).

⁴ We use the term “aviation insurance market” loosely to refer to the group of insurers writing risks in the commercial aviation sector. For a detailed overview of the different types of aviation insurance available, see Margo (1996).

⁵ Viccars (2001, p. xiii).

they use conventional business management principles applied in the way they operate. Insurance companies should cover the cost of running the business, expenses, and commissions and, together with any investment income, provide a reasonable profit and return on the capital employed. Similarly, the insurance market works to spread the risk between a large number of insurers and reinsurers so that the amount any one insurer is exposed to is kept within acceptable limits. A decade ago, “[by] the time a major airline risk [had] been fully reinsured, hundreds or even thousands of insurers and reinsurers [would] have [had] a share. But, nowadays, with continuing consolidation in the market, the number of participants has fallen significantly, although in a typical deal it is still over a hundred.”⁶

There are a number of features that set aviation insurance apart from other classes of insurance. Perhaps the three most significant are the limited number of risks available to insure, the comparatively small size of the insurance class, and the industry’s exposure to catastrophic events.⁷

The main characteristic of the aviation insurance segment is that relatively few risks are available to insure. This is especially so if only airlines are considered. At the end of 2003 there were 765 airlines worldwide operating about 16,400 Western-built jet aircraft.⁸ At that time, the total fleet value of these airlines was estimated at around \$570 billion—a figure that, due to some contraction and subsequent stagnation in the aviation market following 9/11, was largely equal to the estimated total year-end fleet value of \$580 billion in 2000. After several more years of lackluster growth at around 2.5 percent from 2003 to 2006 (which was well below the 8.2 percent average annual growth rate from 1992 to 2000), airline fleets have only recently exhibited some significant expansion, with growth rates in 2007 estimated at around 11 percent—bringing total insurable fleet values to approximately \$670 billion (Aon, 2007). However, despite these seemingly large figures, the actual number of individual risks is comparatively small since there are several airline groups where insurance is purchased on behalf of all the members of the group. In addition, the exposure, in terms of fleet value (or indeed size of fleet) is dominated by a few very large airlines or groups of airlines, with the 20 largest accounting for well over 50 percent of the total value at risk. The 100 largest airlines account for 90 percent of the exposure as measured either by value or passengers carried.

The aviation insurance market is very small in comparison to most other classes of non-life insurance. For the year 2007, the total gross annual premium for the entire aviation insurance market (including all airline, products and services, space, general aviation, and hull war policies) was approximately \$5.25 billion. These aviation premiums represent only about 0.1 percent of the worldwide insurance market and are considerably smaller than, for instance, the annual premiums for automobile insurance even in small countries. Examples of comparisons between aviation and other classes of business that illustrate how insignificant aviation is in the insurance world, are often quoted—one such example points out that the cost of insuring all airlines

⁶ Based on the comments of an insurance underwriter who wishes to remain anonymous.

⁷ The word “risk” is used in this context to mean something that is insured, for example, an airline fleet. This is common usage in the insurance market, but of course, it can lead to confusion with the more conventional use of the word.

⁸ Jet Operator Statistics (2004), Issue One, Airclaims Ltd.

around the world approximately equals the cost of insuring plate glass in New York State.⁹

Nevertheless, while aviation as a class has one of the smallest premium bases in the insurance industry, it has one of the highest exposures to potential catastrophes.¹⁰ Some new Boeing 747s are insured for over \$250 million and many wide-bodied jets will be insured for more than \$100 million each, while for liabilities (passengers and third party liabilities) a combined single limit of \$1.5 or \$2 billion will be bought.¹¹

One estimate of the total gross premium income received from airlines during the 2007 underwriting year is \$1.5 billion.¹² Thus, there is potential for the single loss of a wide-bodied aircraft to account for more than the total annual premium income for this class of insurance. In addition, there is, of course, always the very small chance of a collision between two such aircrafts. So, how do aviation insurers plan for such possibilities?

Aside from in-house risk assessments performed by insurance firms themselves, much of the planning for such disasters is performed by Lloyd's of London, which is often characterized as the most venerable aviation insurance institution in the world (cf. El-Kasaby et al., 2003).

In 1996, Lloyd's introduced a number of realistic disaster scenarios (RDS), which had been developed by their Regulatory Division. Lloyd's Syndicates have to demonstrate their capability to meet all their commitments, which might arise from these prescribed scenarios, if they are to continue to do business at Lloyd's. There is currently only one RDS, which specifically addresses aviation risks. This RDS, titled "Aviation Collision" initially ran as follows "Assume a collision between 747s of the syndicate's two highest airline exposures occurring over a major U.S. city; Assume liability loss of U.S.\$1 billion per airline."¹³ Among other changes, the assumed liability loss has, more recently, been increased to a total of \$4 billion.¹⁴ An actual occurrence of this scenario would produce a loss equivalent to more than 2.5 times the 2007 gross premium income of \$1.5 billion from all airline business worldwide (Aon, 2007).

With the exception of 9/11, where the currently estimated incurred loss falling on aviation policies is some \$4.6 billion for the insurance and reinsurance industry (cf. Hartwig, 2006), so far there has been no aviation loss which has approached these levels. Nevertheless, in any 1 year, while there are relatively few total losses and/or fatal accidents, there is always the potential for a catastrophe. In the last 14 years there have been 46 losses of over \$100 million (see Table 1). On average, this amounted to about three per year, but of course, these events have not been evenly distributed. Consequently, with a small premium base and occasional catastrophic losses, the airline insurance market can be very volatile.

⁹ See Viccars (2001) who notes, "It was said that the annual premiums for the (aviation) class were less than the annual plate glass insurance premium for the State of New York."

¹⁰ Viccars (2001, p. xvi).

¹¹ Based on data provided by Airclaims Ltd.

¹² Reuters/Business Wire, January 16, 2008—" \$300m Hole in Aviation Insurance Cover—Industry Experts Warn Premiums Will Have to Rise."

¹³ Lloyd's of London, Regulatory Bulletin Annex 1 (February 1997).

¹⁴ Lloyd's Realistic Disaster Scenarios: Scenario Specification (April 2006).

TABLE 1

Number of Catastrophic Losses Between 1994 and 2007 (Loss \geq \$100 million)

> \$100 million	46
> \$200 million	22
> \$300 million	13
> \$400 million	8
> \$500 million	4

Source: Ascend Worldwide Ltd. (Cross-referenced with information retrieved from www.nts.gov, www.aviation-safety.net, www.airdisaster.com, and www.airdisasters.co.uk).

An airline's various aviation risks are normally insured as a whole with one combined policy covering loss or damage to the aircraft in its fleet and its legal liability to passengers and third parties. No single insurer has the financial resources to retain a risk of the size of a major airline or even a substantial proportion of such a risk. Except at the local level, which generally only applies in countries with a legal requirement to place insurance with insurers based in that country, and where insurers will retain none or very little of the risk, very many insurers/reinsurers will be participating in the risk at each step. Each step, each link in the chain, is brought together by a broker.

An airline's risk will be insured by a number of insurers, each of whom enters into a separate contract of insurance with the insured. One of the insurers will act as the leader for the risk and will negotiate the terms and conditions for the cover provided. This lead insurer will typically also be responsible for handling any claims that arise. The other insurers, known as the following underwriters, will normally conform to these conditions, as it would be impractical to have different ones for each participant.

Once the leader has signed the slip, the broker will approach other underwriters at Lloyd's or insurance companies in London and elsewhere and invite them to take a part of the risk.¹⁵ Each underwriter (insurer) will then take a line (a percentage) of the risk. The insurance cover will be completed once underwriters accepting 100 percent of the risk have signed the slip.

Three of the largest aviation insurers, Global Aerospace, USAIG, and La Reunion Aeri-
enne, are pools, each writing business on behalf of five or six different insurance companies. A smaller insurer, Aviabel, writes business on behalf of 10 insurers.

For international (i.e., non-U.S.) airline risk, the London Market dominates as it accounts for nearly 60 percent of the competitive capacity and over 50 percent of the total capacity.¹⁶ The London capacity is split, roughly equally, between insurance companies and Lloyd's Syndicates. A long way behind London is Paris with an estimated 10 percent of

¹⁵ A "slip" is a document, prepared by a broker, that sets out, in abbreviated form, a proposal to an underwriter (insurer) for insurance. See Margo (2000, p. 6.11).

¹⁶ Based on data provided by Airclaims Ltd.

the world's competitive capacity and 12 percent of the total capacity for international business.

The insurance cover for most non-U.S. airlines is led off in London, either directly or as facultative reinsurance of a local insurer. The London insurers leading the airline business include such companies as Global, AIG, Allianz, Lloyd's Syndicates, ACE, Amlin, and Wellington. In Paris, La Reunion Aerienne leads an increasing number of international airlines.

The U.S. market dominates the insurance of U.S.-based airlines. London and, indeed, other international markets take a share of U.S. airline risk but they are nearly all led by U.S.-based insurance operations, which will also take a significant percentage of the risk. Major U.S. aviation insurance operations are USAIG, Global (Short Hills), and AIG (Atlanta).¹⁷

Currently, U.S.-based aviation insurers generally do not write non-U.S. airline business, although there is a notable exception, Houston Casualty Company, which will write difficult risks in Africa, South America, the Commonwealth of Independent States (CIS), and elsewhere. There is a saying in the insurance market that there is no such thing as a bad risk, only a bad rate; that is, everything is insurable for the right price. However, the price is high—20 percent for some African risks and, although not necessarily aviation related, 30 percent for some space risks. Major airlines in Europe generally will be paying less than 1 percent and closer to 0.1 percent. At the time of writing, one major UK airline had a rate of 0.088 percent for its hull cover and \$0.256 per 1,000 revenue passenger kilometers (RPKs) for liability (based on data provided by Airclaims Ltd.).

There are not more than about 50 insurers writing airline business worldwide, and this number includes some who will only write risks based in certain countries or who are niche players.

REINSURANCE

Aviation, and, in particular, airline insurance, cannot provide insurers with a balanced portfolio because of the small number of risks.¹⁸ Therefore, direct insurers rely on reinsurance to help smooth out the effects of random fluctuations in losses and reduce the impact of catastrophic losses.

¹⁷ Global is based in London but mainly writes U.S. airline risks through its U.S. operation while AIG, which is a U.S. insurer, writes international, that is, non-U.S. business, in London and only U.S. business in the United States.

¹⁸ The basis of insurance is the law of large numbers, first described around 1700 by Jakob Bernoulli. For any individual risk it is impossible to predict the exact moment when fate will strike or the extent of the loss that will be incurred. But if insurers are covering very many similar risks then statistical methods are used to predict future trends. The fate of any individual risk is still not known but it is known how many losses of a certain type occur over a given time in a large population of risks. As such, a large motor insurer providing cover for several hundred thousand cars would be considered to have a balanced portfolio. Examples of portfolios with extremely poor balance, on the other hand, include nuclear power and aviation where a potentially huge exposure arises from a relatively small number of objects insured (Swiss Re, 2002).

The direct insurers on a risk will seek to limit their exposure to any loss by purchasing reinsurance. Reinsurance can be divided into two areas: proportional, which includes quota share and surplus, and nonproportional, which includes excess loss and stop-loss.^{19,20}

The reinsurance manager of a large aviation insurer in London has confirmed that they are currently not using any proportional reinsurance, either quota share or surplus, as part of their reinsurance program. “[With this] you end up giving away good premium. [These] are only used by insurers who would otherwise not be able to take a large line. Brokers would [otherwise] only bother coming to them with rubbish risks where they were scraping the bottom looking for everyone to complete the risk. The good risks could be completed by just going to the big boys and the toddlers would never be shown them.”²¹

One form of nonproportional reinsurance is excess of loss. Under an excess of loss treaty the reinsurer is only liable to pay losses over a defined amount and up to a further defined limit. Any losses falling below the lower limit therefore remain with the reinsured. Excess of loss will normally be placed in layers providing cover at different levels of loss, and again, many reinsurers can participate.

Prior to 9/11, cover could be bought down to \$20 or \$30 million of original loss or even lower. “After 9/11 this entire market was killed off. You cannot get excess of loss for levels much less than \$300 or \$400 million of original loss now. One major reinsurer [name omitted for confidentiality] will not provide excess of loss below \$600 or \$700 million of original loss.”²²

After a loss that impinges on a layer of excess loss cover has occurred, the cover has to be reinstated in case another such loss happens. These reinstatements can either be bought up front, at the start of the reinsurance program, or following the loss that exhausted the cover. At high levels of excess loss cover, the reinsured might prebuy only one or perhaps two reinstatements because large catastrophes are fortunately rare.

Following the events of 9/11, where the two aircrafts that hit the World Trade Center can be assumed to have used up the probable one reinstatement at this catastrophic level of loss, insurers would need to have bought further reinstatements or gone bare, which would have exposed them to further catastrophes. After 9/11, reinstatements are still available but their cost has increased.

Most reinsurers have reservations about providing stop-loss insurance, which explains why it is not more widely used.²³

¹⁹ Margo (2000), page 27.07 to 27.08.

²⁰ For a detailed overview of proportional and nonproportional reinsurance please refer to SwissRe—“Understanding Reinsurance,” available online at <http://swissre.com/pws/research%20publications/risk%20and%20expertise/understanding%20reinsurance.html>

²¹ Comments by the reinsurance manager of a major London aviation insurer wishing to remain anonymous.

²² Comments by the reinsurance manager of a major London aviation insurer wishing to remain anonymous.

²³ Swiss Re (2002, p. 28).

FURTHER RISK TRANSFER

Reinsurers will themselves have insurance, sometimes loosely referred to as retrocession, although this term tends to have a more limited but specific meaning. The reinsurance programs of reinsurers can be quite varied depending on their perception of the risk and the structure of their book of business, but generally they all have some form of catastrophe protection in place. However, at these levels, this protection is normally no longer class specific. The catastrophe protection will be covering the reinsurer's whole book, not just their exposure to aviation risk.

Apart from traditional forms of insurance, some of the risk is transferred directly to noninsurance entities through the use of alternative risk transfer (ART) bonds. Broadly speaking, these are financial instruments that investors can choose to include in their investment portfolio as a hedge against a downturn in the financial markets (insurance risk was not thought to be linked to the risk of investing in the stock market, but 9/11 has shown that if the insurance loss is big enough, it can also impact the financial markets). However, although used, these instruments typically only make up a small portion of a reinsurer's reinsurance.

As the risk moves through the insurance chain, from (direct) insurers to reinsurers to retrocessionaires, the insurers involved at each point will be to a lesser and lesser extent aviation insurers. However, there are always exceptions, and two of the largest reinsurers, Munich Re and Swiss Re, both have separate facilities that allow them to write a certain amount of direct aviation business. In addition, Munich Re provides part of the capacity used by Global. Some retrocessionaires occasionally also write direct aviation business, but this is generally rare.

COVERAGE BEFORE 9/11

Although, following an airline accident there are a number of different covers (insurance policies) that will ultimately respond, in the context of this study we will limit our review to the covers bought by airlines, specifically, hull insurance, that provide cover against loss of or damage to the aircraft itself, and passenger and third party liability insurance.^{24,25} Cover for the airline's liability will normally be arranged alongside the hull cover in a single policy with the same insurers insuring both the hull and liability risk.²⁶

Hull cover is affected on a so-called all-risk rather than a named-peril basis with, broadly, the policy responding to the loss of or damage to the aircraft as the result of any accident. Similarly, passenger / third party liability insurance will provide cover for all sums (up to the policy limit) the airline is legally liable to pay for damages arising from bodily injury

²⁴ Other covers, which ultimately respond, particularly in any accident involving death or serious injury, are liability covers for product manufacturers (e.g., aircraft manufacturers, subcontractors, etc.) and service providers (e.g., air traffic management providers or air traffic control).

²⁵ Although, in some instances, an airline liability policy contains separate clauses providing cover for passengers and third parties, it is now generally the case that a single comprehensive clause will include both. A majority of airline liability covers are placed on a combined single limit basis, providing one limit for all passenger and third party liability claims arising out of an accident. Typically, for an airline operating wide-bodied aircraft, this will be \$1.5 or \$2 billion.

²⁶ Viccars (2001, p. 22).

(or death) or property damage to passengers or third parties caused by an occurrence and arising out of or in connection with the insured's operations.²⁷ An occurrence is frequently defined in airline policies as an accident, which results in bodily injury. There has been considerable case law over the exact definition of an accident and bodily injury, but for our purposes it will suffice to take these words at face value.

War Exclusion

As stated above, there are no restrictions on what circumstances leading to an accident are covered—an accident need only occur. However, specific exclusion clauses are always added to aviation policies, which introduce limits to what circumstances or events they will actually respond to.

When the events of 9/11 unfolded in September 2001, most aviation policies included clause AVN48B, the War, Hijacking, and Other Perils Exclusion Clause (Aviation). Very briefly, the clause states that the insurance policy does not cover claims caused by deliberate acts of violence, hijacking, seizure, etc.

With respect to the aircraft's hull, part of the cover excluded by AVN48B was regained—written back into the policy—by the incorporation of clause AVN51, Extended Coverage Endorsement (Aircraft Hulls). However, this clause was normally only used for general aviation and was usually not included in an airline policy. Although AVN51 did reinstate cover for damage resulting from hijacking or any unlawful seizure of the aircraft, it did not reinstate cover for all of the war risk perils excluded under AVN48 and therefore did not provide airlines with the cover they needed.

Cover for full war risks needed by airlines could be affected under the Aviation Hull War and Allied Perils policy (LSW555B) written in the London war market, that is, generally by a different set of insurers. LSW555B provided cover for loss of or damage to the aircraft "against claims excluded from the insured's hull all-risks policy" by AVN48B except for any hostile detonation of any weapon of war employing atomic or nuclear fission and/or fusion or other like reaction or radioactive force or matter. LSW555B also excluded losses, damages, or expenses resulting from war among the Great Powers—the United Kingdom, the United States, France, the Russian Federation, and the People's Republic of China—unless the aircraft was in the air at the outbreak of war, in which case it was covered until it had completed its first landing.

Hull war risk policies usually have a fleet aggregate limit. In 2001, for large international airlines, this limit lay in the vicinity of \$600 million to \$1 billion. This was equivalent to the total loss of approximately 10 wide-bodied aircraft but would not cover the whole or a significant part of a large airline's fleet if it were to be caught on the ground in one place, for example, the Iraqi invasion of Kuwait. For such cases, excess aggregate war risk cover was available. Some war policies also provided for reinstatement at an agreed further premium, but this generally did not increase the policy limit for any one loss.

While war risk cover for aircraft hulls could be purchased in the war market, this market did not insure liabilities. Cover for an airline's legal liability to passengers and third parties had to be obtained by writing it back into the all-risk policy by incorporating Clause

²⁷ Margo (2000, p. 12.01).

AVN52 “Extended Coverage Endorsement (Aviation Liabilities),” in consideration of an additional premium. However, prior to 9/11, this liability write-back was given away by all-risk insurers. Having excluded this cover by including Clause AVN48B in the policy, they then reinstated the cover with respect to liabilities free of charge or cheaply by including AVN52.

Insurers attribute the previous giving away of AVN52 cover to the past weak aviation market. The additional premium for AVN52 was typically charged at around 25 percent of the premium. This then dwindled down to 10 percent and, in many cases, disappeared. It is thought that as AVN52 was always included, the amounts originally shown as a specific additional premium became just an allocation of part of the premium. Then, in the periodical weak market conditions that aviation (airline) insurance goes through, any allowance for AVN52 dwindled away to nothing and was lost.

Prior to 9/11, AVN52 (AVN52C) reinstated (wrote-back) the full combined single limit stipulated in the policy for both passengers and third parties. But, following this catastrophic loss, the coverage afforded by this write-back was limited going forward. Although it continued to reinstate the full all-risk limits with respect to the aircraft’s passengers, initially it was limited to just \$50 million with respect to third parties. After 9/11, this limit was increased to \$150 million or in some cases \$250 million but was still generally far below the coverage that airlines required.

In summary, prior to 9/11, an airline’s fleet and its legal liability to passengers and third parties in the event of an accident was covered by a combined hull and liability policy for all risks. However, any loss as the result of deliberate acts of violence was excluded by the standard inclusion of Clause AVN48B. In the case of a loss resulting from an act of violence, cover for the aircraft was provided by a war-risk policy (LSW555B), while liability cover for the passengers and third parties was written back into the all-risk policy by the standard inclusion of Clause AVN52.²⁸

CHANGES AFTER 9/11

The events of 9/11 were catastrophic and, although the expected loss falling on aviation policies amounted to *only* around \$4.6 billion, which was less than 13 percent of the estimated total insured loss of \$35.9 billion (Hartwig, 2006), in comparison with the premium generated by this class of business, it was by far the worst impacted by the event.

During 9/11, in which airliners were, in effect, used as weapons, resulting in a huge loss of life, also changed the industry’s views on this type of risk. Aviation insurers began to realize that the impact of some forms of terrorism was unquantifiable and therefore uninsurable, while their capital providers realized that the magnitude of the potential exposure they had in aviation was out of proportion to the small premium income that

²⁸ Note that both an airline’s hull and liability all-risk policy and its hull war-risk policy are policies of indemnity, that is, subject to any limits set out in the policies. If the claim is valid, insurers will indemnify the insured for the loss so that it is as if the loss had not occurred. Being policies of indemnity, insurers and indeed reinsurers have the right of subrogation—“once the insurers have indemnified the insured under the policy they step into his shoes in relation to any rights of recovery that may be available to the insured against third parties” (Margo, 2000, p. 23.61).

it generated. Capital providers ceased to see aviation simply as a small residual market they could move surplus money into and out of depending upon the attractiveness of the returns in their main property/casualty business and were suddenly confronted with the realization that aviation could hurt them.

While the events of 9/11 were shocking in the true sense of the word and it was recognized, even in the first hours, as the largest loss ever sustained by the insurance industry, there seems to have been little or no concern among insurers that they would not be able to meet the financial demands arising from the event.

However, the impact on the aviation insurance market was such that insurers had to act quickly to protect their business going forward and reinflate the market. Insurers quickly took action to limit their exposure to this type of event in the future and to generate large amounts of additional income through the introduction of surcharges. Other reactions included, for example:

1. Immediately all outstanding quotes were withdrawn,
2. Effective 23:59 GMT on September 17, 2001, insurers gave notice of cancellation of AVN52C,
3. On October 1, 2001, special surcharges for passenger and cargo airlines and hull war cover were introduced, and
4. Drafting of a new AVN48 began.

The aviation insurance market's first act after the attacks was to withdraw all outstanding airline all-risk and hull war quotes that had not been accepted. Underwriters needed time to assess their position; this was of "paramount importance."²⁹

In the first week, meetings were held in London between representatives of Lloyd's Aviation Syndicates and the insurance companies to review the cover and terms of AVN52C. According to Willis, "[they were] determined to be in a position to be able to maintain coverage for the world's airline communities, albeit on a more restricted basis."³⁰ As a result of these meetings it was decided to give notice of cancellation of the coverage afforded by AVN52C to all aviation risks, as this was the only way that insurers could give notice of a review of its coverage. Letters were sent to all insureds giving them the required 7-day notice of cancellation taking effect from 23:59 GMT of the date of the letter. The notice given to U.S. domiciled insureds was extended by an additional 48 hours to allow it to be made by recorded delivery.

AVN52C was subsequently replaced by AVN52D (also, in due course, by AVN52E for nonairline risks). AVN52D was almost identical to AVN52C except, most importantly, it introduced a much lower sublimit as far as cover for an airline's legal liability to third parties was concerned—\$50 million—for any one occurrence and in the aggregate.

On October 1, 2001, special surcharges were introduced to reflate [sic] the market. These included:

²⁹ Willis Global Aviation Bulletin, No. 48 (September 19, 2001).

³⁰ Willis Global Aviation Bulletin, No. 48 (September 19, 2001).

1. A \$1.25 charge per passenger for each departure applicable to any airline operating any one aircraft with a seating capacity in excess of 15 passenger seats,
2. A 10 percent surcharge on the composite hull and liability all-risk premium paid by cargo airlines, and
3. For hull war, a 1-year special charge of 0.05 percent based on the declared average fleet values at risk for all airlines. This was payable pro rata up to the expiry of the then existing policies and then going forward on renewal pro rata until October 1, 2002.

The most significant of these measures was the reduction of AVN52 cover for third parties to \$50 million. This would have grounded the world's airlines since they operate subject to various contractual agreements, requirements, and conditions of use, which normally stipulate considerably higher levels of cover. Fortunately, the world's governments stepped in and provided other forms of government-sponsored insurance or gave indemnities to allow the airlines to continue operating (for a detailed discussion of insurance covers provided by the various governments around the world post-9/11, see Carpenter, 2007).

Initially, no commercial insurance cover for third party legal liabilities above \$50 million was available, but in due course, a number of insurers began to provide separate policies with higher limits—terms and limits differed but, generally, up to \$1 billion (i.e., \$950 million in excess of \$50 million) plus, where appropriate, a second layer up to \$2 billion (\$1 billion in excess of \$1 billion).

Five companies—AIG, Allianz, Axis, Berkshire Hathaway, and GE Frankona—with subscribing markets following (the excess third party liability market), provided this excess third party legal liability cover.

Prior to 9/11, market estimates for the 2001 premium income for the airline business was \$1.66 billion for all-risk and \$190 million for hull war, for a total of \$1.85 billion. It is estimated that, after 9/11, the surcharges and excess third party legal liability cover cost the airlines an additional \$3.08 billion in that year for a total cost of \$4.93 billion—more than two and a half times what had earlier been expected (based on data provided by Airclaims Ltd.).

In the years since 2001, several changes have taken place. The \$1.25 per passenger and 0.05 percent hull war surcharges were “easing by the third quarter of 2002 with a trend to blend both into the base rates . . . in real terms the \$1.25 reduced to \$1.00 in most cases (and less in some) and hull war was down to 0.0375 percent.”³¹ Reductions have continued since then. Meanwhile, the commercial third party legal liability market was said to be “softening their quotes”³² and the third party liability limit in AVN52 has begun to edge up. In August 2004, for example, Monarch Airlines' cover was renewed with an increased primary AVN52 limit of \$250 million. Since then, even more favorable renewals have taken place in what Aon (2007) describes as a continued soft market for aviation insurance in recent years.

³¹ The Heath Lambert Report on Airline Insurance, Iss. 13 (October 2002).

³² The Heath Lambert Report on Airline Insurance, Iss. 13 (October 2002).

Most of the standard aviation insurance clauses were originally defined in London by Lloyd's Aviation Underwriters' Association (LAUA) in association with its company market counterpart, the Aviation Insurance Officers' Association (AIOA). More recently, this activity has been taken over by a market working party, the Aviation Insurance Clauses Group (AICG, see http://www.aicg.co.uk/aicg_public/default.asp).³³

In August 2006, AICG published a series of new aviation liability clauses to address exclusions and write-back issues relating to the use of weapons of mass destruction. As envisaged in the aftermath of 9/11, the main difference between the clauses is the inclusion of new perils including the hostile use of radioactive contamination or matter, electromagnetic pulse, or chemical or biological materials for political or terrorist purposes, and the expansion of the definition of hijacking to bring it into line with the wording of the 1970 Hague Convention for the Suppression of Unlawful Seizure of Aircraft.³⁴

These new aviation liability clauses include AVN48C and AVN48D. Both of these clauses follow the familiar format of AVN48B but introduced particularized (alternate form) exclusions for war perils. AVN48C is typically combined with AVN52H (aircraft operators) and AVN52J (service providers), while AVN48D works with AVN52K (aircraft operators) and AVN52L (service providers). In each case, the companion clauses write back some of the risks excluded by AVN48C and AVN48D (Hughes, 2006).

AVN48C, AVN52H, and AVN52J are underwriter-sponsored clauses originally written upon request of Lloyd's and the London Company Aviation Underwriter Associations. These three clauses effectively exclude (without any write-back) all cover for the hostile use of weapons of mass destruction (WMD), namely, nuclear, radioactive contamination (RADCON), bio/chemical (BIO/CHEM), and electromagnetic pulse (EMP) devices or materials.

AVN48D, AVN52K, and AVN52L are sponsored by Marsh, IATA, and AEA and are available since November 2005. Contrary to AVN48C and its companion clauses, these three clauses are aimed at providing limited WMD cover for RADCON, BIO/CHEM, and EMP devices or materials, particularly when these are employed only onboard a single aircraft. There is, however, no cover for nuclear or atomic detonations.³⁵

Many insurers are currently making further changes in policy wordings as the possible implications of modern terrorism are more fully thought through. Yet, there is a very

³³ Specifically, from 1961 to 2005, standard wording for aviation insurance contracts (particularly those resulting in the so-called AVN and LSW series) was elaborated by the Joint Technical & Clauses Committee (JTCC), which consisted of members from LAUA and AIOA. While these clauses were nonbinding, they became the norm for almost all insurance contracts. Following allegations of anticompetitive behavior by aviation insurers in the aftermath of 9/11 and a number of related investigations by the European Union, the JTCC was dissolved and was replaced by the Aviation Insurance Clauses Group (AICG) on June 24, 2005. Although the AICG continues to draft standardized clauses under the AVN series, it provides more transparency as it allows third parties such as reinsurers, brokers, and clients to get involved in the drafting process. See Caplan (2006) for a detailed overview of the AICG.

³⁴ Lloyd's Aviation Underwriters Association (LAUA) Letter (May 2004).

³⁵ For a detailed discussion of the expected consequences these insurance clauses will have for both insurers and insureds, please refer to Hughes (2006) and Caplan (2006).

strong belief that commercial concerns, insurers, and their customers should not bear the cost of what could be described as state risks and that governments should take over responsibility for indemnifying victims of terrorist attacks. This already happens in certain circumstances in certain countries.³⁶

UNDERWRITING

“The critical issue [for the aviation insurance market] is to find a sustainable level of premium that is both justifiable to buyers and also sufficient to attract and retain the high quality capital providers necessary to cater for ever increasing risk exposures.”³⁷

There are, of course, many factors that affect the price that an airline pays for insurance. Unfortunately, with the possible exception of its own loss experience, an airline has little chance of influencing many or any of the most significant of these. There are a number of factors that are completely outside the airline’s control but that have a major impact on the cost of insurance. Factors that impact insurance rates include:

1. Money and insurance market factors
 - The availability of capital (capacity),
 - Interest rates and available rates of return on investments,
 - The availability and price of reinsurance, and
 - Competition within the insurance market.
2. Factors applicable to the class as a whole
 - The claims experience for the class as a whole,
 - The size of the risk exposure (e.g., fleet value and number of passengers carried),
 - Type of aircraft operated and their age, and
 - Country/region of the world where the risk is domiciled.
3. Factors specific to the risk itself
 - Specific claims experience,
 - Specific exposure profile, and
 - Technical factors such as crew training, maintenance, equipment, safety culture, and financial health.

³⁶ Note that in the years following 9/11 there has been considerable debate among airlines, insurance firms, and various governmental bodies (particularly in the European Union) regarding governments’ role in indemnifying airlines against any liabilities that may arise from terrorist attacks in which airplanes are used weapons and that are intended to harm a country or its citizens rather than the airline whose plane(s) are used. See Abeyratne (2005) and Caplan (2005a) for a detailed discussion of recent developments in this area.

³⁷ Comments made by Andre Clerc at the 23rd Annual Conference of the Willis Aviation Law Association of Australia and New Zealand, Sydney, 2004.

It should be noted that the technical factors for the risk are listed last. This is because, in most cases, they have the least impact on the airline's insurance rate. Nevertheless, underwriting owes more to art than science and the final rate charged depends upon the underwriter's judgment with respect to a number of soft factors.

All else being equal, the money and insurance market factors have had the largest impact on the cost of insurance over time. As can be seen from Table 2 and Figure 1, the aviation insurance market goes through very marked hard/soft cycles and, although the start of the move from a hard market to a soft market or vice versa is triggered by a period of exceptionally good or bad claims experience, the reaction of the markets to this experience will exacerbate any tendency to move from one market state to another. Because aviation is such a small class of insurance, money flows, into or out of the class, which represent only a relatively small percentage of the capital employed in, say, property/casualty insurance, can have a very marked impact in aviation, resulting in a high degree of volatility.

Apart from its effect on the market cycle, trends in the overall claims experience for the class will also impact the price individual airlines have to pay for insurance. Underwriters will determine the total amount of premium needed to meet average expected claims levels and then add an allowance for future catastrophes, commissions and expenses, and profit (return on capital employed). This total then needs to be shared between the different risks. Depending upon other factors, insurers will differentiate between risks, but if, for instance, the recent claims experience has been bad, everyone will pay more than they would otherwise.

As noted above, other generic factors that are significant include the size of the airline, as measured by the number of aircraft operated; the number of passengers carried; the country or, more generally, the region in which the airline is domiciled; and the class of aircraft operated. The past loss experience, called a burning rate or loss rate, will be calculated for each of these generic groups and then used as part of the input when calculating the rate to be paid by the airline. Note that this is independent of the airline's own experience.

These generic groups are quite broad. Airlines are divided between, say, four or five size groups—smaller airlines, as a group, historically have had a worse experience than larger ones. Similarly, the world is divided into five or six regions—airlines domiciled in Latin America or, in particular, Africa, again, as a group, have historically had a worse experience than airlines from, say, Europe. And turboprop airliners, so-called Eastern-built aircraft and old, first- or second-generation Western-built jets, again, as a group, tended to have a worse record than newer Western-built jet airliners.

Airline size, as measured by its fleet value and either annual number of passengers carried or RPKs, will also affect the price paid for insurance, in that the rate charged does not increase linearly with the exposure. All else being equal, an airline with a higher fleet value and/or more passenger traffic will be given a lower insurance rate. For instance, in the Marsh August/September 2004 aviation newsletter it was noted that "the average hull rate reduction for September currently stands at minus 18 percent [but] this is indicative of the substantial growth in exposure not a weakening in the market." In the same context, Aon (2007) points out that between 2004 and 2007, hull and liability insurance premiums declined by an average of 11.5 percent per year and

TABLE 2
Airline Premiums and Airplane Accidents (1975–2007)

Panel A: Estimated Airline Premiums (All-Risk and AVN52, Excluding Excess Third Party),
Number of Accidents, and Fatalities

Year	Airline Gross Premiums ^a (\$ Million)	Number of Accidents	Number of Fatalities
1975	325	22	1,058
1976	295	31	1,804
1977	305	26	1,616
1978	360	24	1,113
1979	420	32	1,673
1980	485	20	1,247
1981	490	17	807
1982	505	26	1,209
1983	530	21	1,292
1984	730	17	594
1985	980	27	2,393
1986	1,300	23	884
1987	1,215	27	1,324
1988	770	34	1,572
1989	480	38	1,703
1990	340	26	806
1991	675	31	1,060
1992	910	25	1,263
1993	1,310	25	877
1994	1,730	31	1,351
1995	1,950	31	1,003
1996	1,750	27	1,960
1997	1,410	28	1,172
1998	1,015	28	1,088
1999	1,020	44	714
2000	1,340	37	1,097
2001 ^b	3,770	45	3,885
2002	3,340	43	1,224
2003	2,740	23	796
2004	2,385	29	543
2005	2,218	27	1,050
2006	1,841	11	782
2007	1,547	11	593

(continued)

TABLE 2
(Continued)

Panel B: Correlation Coefficients Between Airline Premiums and Accident-Related Information (Using Concurrent Accident Statistics)

Variable	Correlation Coefficient	<i>p</i> -Value
Number of accidents	0.3163	0.0732
Number of fatalities	0.2339	0.1902
Death rate (number of fatalities/number of passengers) on crashed airplanes	0.1966	0.2875

Panel C: Correlation Coefficients Between Airline Premiums and Accident-Related Information (Using Aggregate Accident Statistics in Concurrent and Previous Year)

Variable	Correlation Coefficient	<i>p</i> -Value
Number of accidents	0.4125	0.0171
Number of fatalities	0.2883	0.1038
Death rate (number of fatalities/number of passengers) on crashed airplanes	0.3087	0.0914

^aExcludes premiums for hull deductible insurance. Figures are based on market estimates and are the average for the estimates in each year.

^bEstimates for the 2001 airline premium prior to the events of 9/11 were \$1.6 billion for all-risk and \$190 million for hull war, for a total of \$1.85 billion. Therefore, airlines paid an additional \$3.08 billion that year for cover.

Sources: Airclaims Ltd. and Aon Ltd. (Airline Premiums), www.nts.gov, www.aviation-safety.net, www.airdisaster.com, and www.airdisasters.co.uk (Number of Accidents and Fatalities).

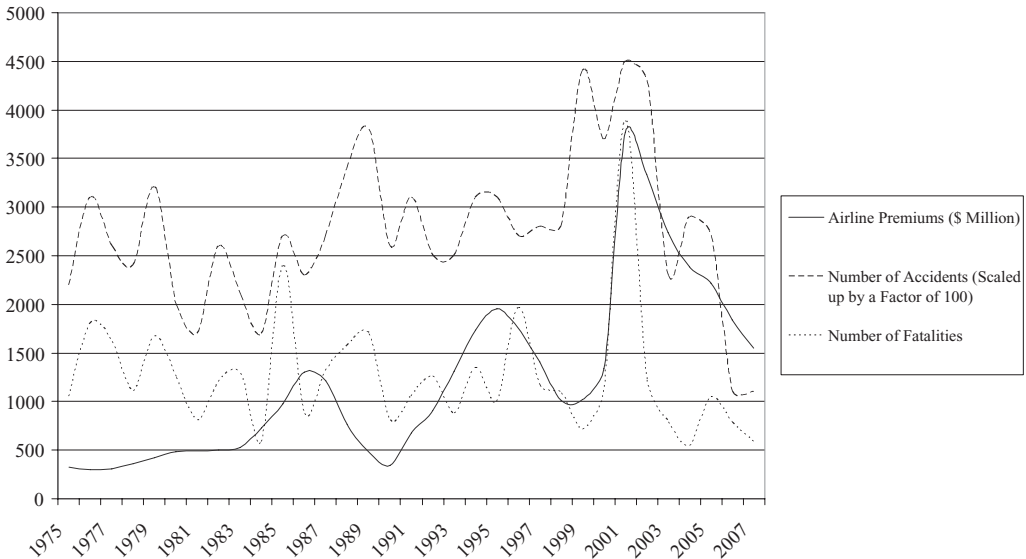
notes that some of this decline can be attributed to the continuing consolidation in the airline industry and the growth of group insurance programs that allow airlines to take advantage of economies of scale.

Aircraft age also has a technical impact on the hull insurance rate since older aircraft are normally worth less than new ones but any repairs will cost much the same. Therefore, for the same damage, the cost of repairs for an older aircraft will represent a larger percentage of its agreed (i.e., insurance) value than for a newer aircraft. Underwriters choose to factor this in when working out the hull rate. This is traditionally done using the so-called 70/30 formula to increase the rate for the older aircraft (although known as the 70/30 formula, the actual ratio can be anything depending upon the insurer's own experience, based on his underwriting statistics).

Turning now to factors that are specific to the risk being insured, perhaps the most significant is the airline's loss ratio for attritional losses, excluding any major losses unless there has been more than one in the period under review. This is then factored into the calculation of the final rate. It would seem that, except for this loss experience,

FIGURE 1

Estimated Airline Premiums (All-Risk and AVN52, Excluding Excess Third Party), Number of Accidents, and Fatalities (1975–2007)



Sources: Airclaims Ltd. and Aon Ltd. (Airline Premiums), www.nts.gov, www.aviation-safety.net, www.airdisaster.com, and www.airdisasters.co.uk (Number of Accidents and Fatalities).

underwriters make the assumption that a risk will perform no better and no worse than its broad peer group.

Although major losses are excluded in this calculation because they distort the figures, underwriters certainly will take any major losses into account when setting the rate. As common wisdom in the insurance industry goes: “If you’ve had a big loss you’re not going to get a reduction.” However, although the rate increases in the year following a disaster and remains higher in the following years, underwriters will not be seeking to recover the full amount paid out through increasing the premium. After all, what would be the point of buying insurance if that was the case?

The next consideration, which, although specific to the individual risk, is still generic in nature, is an airline’s exposure profile (as opposed to risk profile), particularly with respect to its exposure to the different legal liability regimes. For instance, an airline that carries a relatively higher percentage of U.S. citizens will tend to be charged more since compensating for the death or injury of a U.S. citizen will cost more than for some other nationalities.

Lastly, as far as technical factors are concerned, once underwriters have differentiated between the different risks using such generic shortcuts as size, domicile, etc., there is an expectation that all airlines in a specific grouping are essentially the same.

Nevertheless, underwriters must still differentiate to some extent between different risks within a peer group. If a certain airline addresses safety concerns better than its peers,

it will generally be taken into account during rate negotiations. Yet, it is not possible to quantify what effect any particular safety initiative has on the cost of insurance other than to say that it is minimal.

An airline that fits a new device or introduces a new procedure that is intended to reduce a particular risk may indeed reduce this risk but as long as it is not eliminated entirely and as new risks are introduced, it is still only part of the total risk run by the airline. One underwriter wishing to remain anonymous commented that “all these goodies will not affect the rate but the proof of the pudding is in the eating—if these improve safety then it will be reflected in their loss experience.”

Although incremental improvements in safety may not actually be directly reflected in the insurance rate charged, this does not mean that the opposite is also true and it is likely that it is not. Within a given peer group underwriters expect all the airlines to have the same general safety culture—they have all got those (EGPWS, TCAS, etc.) now—and might seek to charge a slightly higher rate if an airline stood out from its peers through not meeting the expected standard of safety.³⁸

These comments hold true for normal situations. Underwriters are certainly more inclined to significantly penalize (or reward) airlines in more hazardous times. Following the recent destruction of two Russian aircrafts, apparently as the result of two suicide bombers boarding the aircraft at Domodedovo Airport, Moscow, most underwriters now consider Russian airlines operating from airports in CIS countries to be at much greater risk. Consequently, they have increased the additional premium charged for AVN52, writing back legal liability cover initially excluded by AVN48B (now AVN48C). This particular subset of airlines is thus penalized for the apparently perceived lack of security at CIS airports. However, if any of these airlines are able to demonstrate to underwriters that their security is good, they will not be charged the higher additional premium—in effect they will be rewarded for having better security.

To provide some basic empirical evidence of the relationship between airline insurance premiums and insurers' claims experience over time, we examine trends in aggregate airline premiums and accident statistics (number of accidents and aggregate number of fatalities) during a sample period that ranges from 1975 to 2007. Information on airline premiums during this time period is based on data provided by Airclaims Ltd. and Aon Ltd., while accident statistics have been collected from various government agencies such as the website of the U.S. National Transportation Safety Board (NTSB) and several privately administered online databases including www.aviation-safety.net, www.airdisaster.com, and www.airdisasters.co.uk. During our data collection, we cross-referenced these databases with each other to ensure their accuracy.³⁹

³⁸ Based on comments by an underwriter who wishes to remain anonymous (note that EGPWS = Enhanced Ground Proximity Warning System, and TCAS = Traffic Collision Avoidance System).

³⁹ Note that the NTSB distinguishes between aviation “accidents” and “incidents.” The definition of an accident used by the NTSB generally follows that of the International Civil Aviation Organization (ICAO) Annex 13, being any event that causes death or serious injury and/or substantial damage to the aircraft from the time the first person boards with intention of flight until the last person leaves after flight. Cases involving no human fatalities or significant damage to the airplane are generally classified as incidents. Incidents are excluded from our sample because they are unlikely to entail any significant premium increases.

Both the figures in Panel A of Table 2 and the corresponding graphs in Figure 1 suggest a positive relationship between airline premiums and insurers' loss experience. This observation is supported by the results of a correlation analysis (see Panels B and C of Table 2) in which we examine the magnitude and significance of the correlation coefficients between airline premiums and three different measures of accident frequency and severity over time. Specifically, in Panel B, we calculate the correlation coefficient between airline premiums and (1) the number of accidents, (2) the number of fatalities, and (3) the death rate per accident, i.e., the number of fatalities divided by the number of passengers on airplanes that were involved in an accident during the concurrent year. Panel C further expands our analysis by considering accidents that occurred during the concurrent and previous year; i.e., it also includes the first lag of the accident statistics in our aforementioned calculations.

Our analysis reveals a significant positive relationship between aggregate airline premiums and corresponding accident rates over time (correlation coefficient = 0.3163 with a *p*-value of 0.0732). The relationship remains positive when we consider our other two accident measures but it is not significant at conventional levels. The positive relationship between airline premiums and insurers' loss experience is even more pronounced when we consider accidents that occurred in both the concurrent and previous years in our analysis. Here the correlation coefficient between airline premiums and the number of accidents is 0.4125 with a *p*-value of 0.0171. Moreover, death rates now show a significant (albeit somewhat weak) relationship with airline premiums, with the correlation coefficient for this variable becoming marginally significant at the 10 percent confidence level.

The aviation insurance cycle between hard and soft markets also modifies the degree to which underwriters are able to reflect other factors in the price they charge for insurance. In addition, the cycle affects the different competition strategies used in the market and this in turn further modifies or limits how underwriters do or can reflect other factors in their pricing of the risk. In a hard market there will be less competition and therefore less need for underwriters to consider reducing their rates to win or retain business. However, in a soft market, competition can be fierce and underwriters feel compelled to reduce their rates to avoid being undercut. The insurance market is, after all, a market that is subject to all the usual market forces.

Whatever rate an underwriter has calculated for a risk "there is one other very important matter to consider. Will any other underwriter offer a lower rate, and if so, is the business of such a quality that we do not wish to lose it? In other words, if there is competition, will we reduce our rates or do we feel that, regretfully, we will have to lose the business? Many underwriters will lower their rate if they believe that, despite what their limited statistics tell them, the risk in question is much better than other, similar ones. Often their intuition may be correct but in many other instances they can go very wrong."⁴⁰

Brokers have and will use this competition to structure the cheapest insurance deal they can get for their clients. Depending upon market conditions, competition will tend to keep down the rate offered by the leader. But there is no need for the followers, the other underwriters on the cover, to use the same rate. Brokers will seek to complete the cover,

⁴⁰ Burrows (1992, p. 60).

picking the lowest rates available in the market from other, acceptable, insurers. This is known as verticalization.

For several years after 9/11 the market has been hard (although it has steadily softened since then). The availability of reinsurance has reduced, so that direct underwriters are retaining more of the risk, and the reinsurance that is available is more expensive. On top of this, capital providers, who previously have seen aviation as a small unimportant class of business into which they could move surplus money, now realize that the class can produce huge losses. They are now treating aviation far more seriously and, if the capital used in aviation does not generate adequate returns, they will put it elsewhere. Since 9/11, a number of aviation insurers have withdrawn from the class because their capital providers did not believe that it could give them the returns they wanted. In these conditions, aviation underwriters' competition strategies are very limited.

CONCLUSIONS

In this study we provide an overview of how the airline insurance industry works and what developments it has undergone in recent years. To insure airlines against accidents and deliberate acts of violence—both of which are fortunately rare but have potentially catastrophic consequences—the airline insurance market employs an intricate and highly sophisticated system through which risk is spread among a large number of insurers.

Clearly, the industry was put to a test on September 11, 2001, but although the events that unfolded on that day ultimately cost the insurance industry billions of dollars, no insurance company was in serious danger of failing as a result. While some insurance companies have withdrawn from the aviation sector as they perceive the risk-reward trade-off to be unattractive, the insurance companies that remain have rewritten their policies and have changed a number of significant clauses to protect themselves from adverse eventualities and to be able to cover even larger potential catastrophes in the future.

Although airlines can continue to insure themselves against most risks, the cost of doing so has clearly increased and has put insurance premiums on the front of airline managers' minds—potentially outweighed by only few factors such as concerns about rising fuel prices. Whether, say, a potential political stabilization in the Middle East or a hopeful reduction in terrorist threats will ultimately reduce the industry's overall risk exposure remains to be seen, but in the long term airline managers can rest assured that competition among insurers is sure to result in a fair equilibrium rate for their risk profile. After all, airline insurance is a good and there are numerous firms that are willing to provide it—albeit at the right price.

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