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# The World Trade Center Disaster: How Terrorist Airline Attacks Can Affect the Legal, Economic, and Financial Conditions of Airlines Under the Montreal Liability Agreement

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In 1999, the International Montreal Liability Convention met to develop the specifics of a new international airline treaty covering liability for airline crashes, now known as the Montreal Liability Agreement (MLA). This treaty replaces and strengthens the terms of the original airline liability treaty established seventy years prior. The MLA is still before the United States Congress, but its pending implementation is looming over U.S. air carriers. The objective of this article is to examine the organizational structure and financial viability of the U.S. airline industry and the potential impact of the MLA on the U.S. airline industry and on airline stock prices.

## I. INTRODUCTION

The terrorist attacks of September 11, 2001 exposed and aggravated the problems of an already fragile U.S. airline industry. Severe and costly security measures implemented following the terror attacks of September 11 exacerbated difficulties caused by thin profit margins created by industry consolidation, the prevalence of on-line ticket purchasing, and the emergence of low-fare carriers.

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Congressional ratification of the liability limits provided for in the MLA would provide a much-needed first step toward stabilizing and strengthening the U.S. airline industry.

One of the goals of the first international airline liability convention in 1929, known as the Warsaw Convention, was to provide liberal liability against an airline with a modest, though reasonable rate of recovery.<sup>1</sup> The practical effects of the Warsaw Convention allowed an airline to (1) immediately determine its maximum loss from an international air crash, (2) limit the airline's own legal cost in defending against liability, and (3) provide rapid compensation to the injured.<sup>2</sup>

The need for liability limits during the early years (from 1925 to 1929) of the commercial airline industry became painfully obvious, as travel by air during that time was demonstrably dangerous.<sup>3</sup> During these years, both domestic and international flights combined to log only four hundred million passenger miles, but the fatality rate during this period was forty-five per one hundred million passenger miles. Today the fatality rate has fallen dramatically to .019 per million miles traveled.<sup>4</sup> As early airline flights increased and international air travel expanded, the need for rules governing international liability grew and ultimately the Warsaw System was formulated.

## II. THE WARSAW SYSTEM

The 1929 International Convention for the Unification of Certain Rules Relating to International Carriage by Air and its subsequent modifications, additions, protocols, and private agreements, is known as the Warsaw Convention or the Warsaw System. This has long been the multinational treaty governing all

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1. Andreas F. Lowenfeld & Allan I. Mendelsohn, *The United States and the Warsaw Convention*, 80 HARV. L. REV. 497, 499 (1967).

2. GEORGETTE MILLER, *LIABILITY IN INTERNATIONAL AIR TRANSPORT 2* (Kluwer, Deventer) (1977).

3. Minutes from the Second International Conference on Private Aeronautical Law (Oct. 12, 1929), in *SECOND INTERNATIONAL CONFERENCE ON PRIVATE AERONAUTICAL LAW*, at 18 (Robert C. Horner & Didier Legrez eds., 1975).

4. National Transportation Safety Board (NTSB) Accidents and Accident Rates, <http://www.planecrashinfo.com/cause.htm> (last visited Jan. 9, 2008).

liability for international air flight.<sup>5</sup> Governing for more than seventy years, the Warsaw System was enacted to protect the new commercial aviation industry from disastrously large judgments from what were, at the time, frequent air accidents. The Warsaw System also provided for international consistency in the response to claims arising from an accident<sup>6</sup> as well as uniformity among countries on the content of tickets,<sup>7</sup> baggage claim checks,<sup>8</sup> and airbills.<sup>9</sup>

The original Warsaw Convention resulted from two international conferences that together drafted a law aiding the development of the fledgling international commercial airline industry.<sup>10</sup> One objective of the Warsaw Convention was to establish a single liability system.<sup>11</sup> Another objective was to provide uniformity in regulating international aviation.<sup>12</sup> The first convention appointed a panel of experts to study the problems of aviation and present proposed

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5. The “Warsaw System” collectively refers to the following instruments: (1) Convention for the Unification of Certain Rules Relating to International Carriage by Air, Oct. 12, 1929, 49 Stat. 3000, 137 U.N.T.S. 11 [hereinafter Warsaw Convention]; (2) Montreal Protocol No. 4 to Amend the Convention for the Unification of Certain Rules Relating to International Carriage by Airs Amended by the Protocol Done at the Hague on 28 September 1955, Sept. 25, 1975, I.C.A.O. 9148 [hereinafter Montreal Protocol No. 4]; (3) Additional Protocol No. 3 to Amend the Convention for the Unification of Certain Rules Relating to International Carriage by Airs Amended by the Protocol Done at the Hague on 28 September 1955 and at Guatemala City on 8 March 1971, Sept. 25, 1975, I.C.A.O. 9147 [hereinafter Montreal Protocol No. 3]; (4) Additional Protocol No. 2 to Amend the Convention for the Unification of Certain Rules Relating to International Carriage by Air, as Amended by the Protocol Done at the Hague on 28 September 1955, Sept. 25, 1975, I.C.A.O. 9146 [hereinafter Montreal Protocol No. 2]; (5) Additional Protocol No. 1 to Amend the Convention for the Unification of Certain Rules Relating to International Carriage by Air, Sept. 25, 1975, I.C.A.O. 9145 [hereinafter Montreal Protocol No. 1]; (6) Protocol to Amend the Convention for the Unification of Certain Rules Relating to International Carriage by Air as Amended by the Protocol Done at the Hague on 28 September 1955, Mar. 8, 1971, I.C.A.O. 8932 [hereinafter Guatemala City Protocol 1971]; (7) Convention Supplementary to the Warsaw Convention for the Unification of Certain Rules Relating to International Carriage by Air Performed by a Person Other than the Contracting Carrier, Sept. 16, 1961, I.C.A.O. 8181 [hereinafter Guadalajara Convention 1961]; (8) Protocol to Amend the Convention for the Unification of Certain Rules Relating to International Carriage by Air, Sept. 28, 1955, I.C.A.O. 7632 [hereinafter Hague Protocol].

6. Lowenfeld & Mendelsohn, *supra* note 1, at 498.

7. Warsaw Convention, *supra* note 5, art. 3.

8. *Id.* at art. 4.

9. *Id.* at arts. 5–8.

10. Lowenfeld & Mendelsohn, *supra* note 1, at 499.

11. MILLER, *supra* note 2, at 13.

12. *Id.*

solutions to a second international convention that would ratify these proposals.<sup>13</sup> Member nations ratified the experts' proposal in October 1929,<sup>14</sup> and it went into effect on February 13, 1933 as a convention, meaning that a group of states initially ratified the proposal at a conference.<sup>15</sup> The United States became a formal signatory to the Convention in 1934.<sup>16</sup> Though air disasters have become significantly less frequent now than in the early days of international air travel, the terror attacks of September 11 raised the same type of concern the Warsaw System was designed to dispel—would an airline, particularly a U.S. airline, be able to survive the economic impact of another September 11 type disaster?

Similar to the Warsaw Convention, the provisions of the later Montreal Convention, although still imperfect and not specifically addressed to the unique anxieties and aftermath created by a terrorist attack, provide a measure of stability and predictability for international air carriers in accordance with the guiding principles evidenced in the Warsaw System.

#### *A. U.S. Response to the Warsaw Convention*

In the eyes of the United States, the Warsaw Convention set a relatively low liability limit in cases of personal injury or death.<sup>17</sup> Under Article 22(1) of the Warsaw Convention, the total amount of damages allowed was 125,000*F* (Poincare francs),<sup>18</sup> or \$8,300 (U.S. dollars).<sup>19</sup> Gold was the treaty standard for determining the value of the franc via the dollar through the currency exchange rate.<sup>20</sup> Ironically, the United States further eliminated the opportunity for inflation adjustments when it froze the value of gold and then abandoned the gold standard altogether. Because of the United States' abandonment of the gold standard, U.S. damage limits froze

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13. *Id.*

14. G. Nathan Calkins, Jr., *The Cause of Action Under The Warsaw Convention*, 26 J. AIR L. & COM. 217, 227 (1959).

15. *Id.*

16. Lowenfeld & Mendelsohn, *supra* note 1.

17. *Id.*

18. *Id.*

19. Warsaw Convention, *supra* note 5.

20. Rene H. Mankiewicz, *The Judicial Diversification of Uniform Private Law Conventions*, 21 INT'L & COMP. L.Q. 718, 719 (1972).

at the last official U.S. gold to dollar exchange rate set by the Civil Aeronautics Board in 1958.<sup>21</sup> Because of a low amount of recovery with no adjustment for inflation,<sup>22</sup> U.S. courts developed legal and judicial gymnastics to avoid the liability limits established by the Warsaw System.<sup>23</sup>

The United States' objections to the Warsaw Convention's low liability limits<sup>24</sup> led to partial amendments of the Treaty over the years at several conferences and meetings.<sup>25</sup> Until the recent developments resulting in the Montreal Liability Convention, the United States had accepted only one modification as adequate.<sup>26</sup> However, that modification was not an official governmental treaty modification, but a private agreement reached by the major commercial airlines in which the companies agreed to strict liability and an increase in liability limits to \$75,000 in international

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21. *Trans World Airlines, Inc. v. Franklin Mint Corp.*, 466 U.S. 243, 243 (1984) (leaving the value of the treaty at about \$8,700 because of the gold exchange rate at the time and up from \$8,200 at the time the treaty was enacted).

22. Warsaw Convention, *supra* note 5. Under Article 22(1) of the Warsaw Convention, the total damage allowed was 125,000F or \$8,300.

23. Larry Moore, *Chan v. Korean Air Lines: The United States Supreme Court Eliminates the American Rule to the Warsaw Convention*, 13 HASTINGS INT'L & COMP. L. REV. 229, 240 (1990) (explaining that in *Chan*, the Supreme Court eliminated the American rule in its interpretation of the Warsaw Convention. This rule set aside the limits of the treaty if the required warning on the ticket was set in a print size that was smaller than ten-point type).

24. For a discussion of recent rulings that have had a major impact on the application of the treaty in the United States since 1988, see Larry Moore, *Mental Injury and Lesion Corporelle in International Aviation Under the Warsaw Convention: Eastern Airlines Inc. v. Floyd*, 22 ACAD. LEGAL STUD. BUS. NAT'L PROC. 504, 505 (1993) (discussing the Supreme Court's rejection of mental or psychic injury as an independent ground for recovering damages under the Warsaw Convention). See also Larry Moore, *The Lockerbie Air Disaster: Punitive Damages in International Aviation Under the Warsaw Convention*, 15 HOUS. J. INT'L L. 67 (1993) (discussing a Second Circuit ruling, which brought the court of appeals into uniformity when it held that punitive damages could not be allowed under the treaty and where the court ruled that the Convention was the sole cause of action for international air accidents); see also Larry Moore, *Air Disasters; Cause of Actions in International Aviation Under the Warsaw Convention; Burying the Ghost of Komlos*, 2 SOUTHEASTERN J. LEGAL STUD. BUS. 57 (1993) (discussing the Eleventh Circuit's reaffirmation of the rule that the treaty provides the only cause of action in international air accidents); see also LAWRENCE B. GOLDBIRSCHE, *THE WARSAW CONVENTION ANNOTATED: A LEGAL HANDBOOK* (Martinus Nijhoff Publishers) (1988).

25. Moore, *supra* note 23, at 232–33.

26. Larry Moore & Stephen P. Ferris, *Air Disasters and Their Financial Effects on the International Aviation Industry: Justification for the Warsaw Convention?*, 4 J. LEGAL STUD. BUS. 107, 107–19 (1995).

accidents.<sup>27</sup> This agreement has appeased the United States enough to keep them in the Warsaw System for the past forty years. The former Civil Aeronautics Board, currently the Federal Aviation Administration (FAA), enforced the agreement not as an international treaty,<sup>28</sup> but as a U.S. agency regulation.<sup>29</sup>

### *B. Montreal Answers the United States*

Near the end of the twentieth century, the sixty-year-old International Air Transportation Association (IATA), in conjunction with the International Civil Aviation Organization (ICAO), sought to address U.S. concerns over the liability limitations of the Warsaw System. On October 31, 1995, members of the international business and academic organizations at Kuala Lumpur adopted the *International Agreement Relating to Liability Limitations of the Warsaw Convention*.<sup>30</sup> This agreement became the basis for the new international treaty. After several years of negotiations regarding the final terms of this treaty, it was ratified and became operational in principle on May 28, 1999, as the *Convention for the Unification of Certain Rules for International Carriage by Air*, known as the Montreal Liability Convention.<sup>31</sup>

## III. APPLICATION OF THE MONTREAL LIABILITY CONVENTION

The provisions of the new Montreal Convention apply only to ratifying nations. After ratification, the new provisions replace the Warsaw Convention for that nation;<sup>32</sup> otherwise, some countries

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27. *Id.*

28. Warsaw Convention, *supra* note 5, art. 32.

29. Liability Limitations of Warsaw Convention and Hague Protocol, 31 Fed. Reg. 7302 (May 19, 1966).

30. Ludwig Weber & Arie Jakob, *Current Developments Concerning the Reform of the Warsaw System*, 21 ANNALS AIR & SPACE L. 301, 304 (1996).

31. For a comparison between the new Montreal Liability Agreement and the old Montreal Agreement and Warsaw Convention, see Larry Moore, *The New Montreal Liability Convention, Major Changes in International Air Law: An End To the Warsaw Convention*, 9 TUL. J. INT'L & COMP. L. 223, 227 (2001). For the full text of this agreement, see *Montreal Liability Convention*, 24 ANNALS AIR & SPACE L. 25 (1999).

32. See Larry Moore, *The World Trade Center—Terrorist Airline Destruction: Will this Be the First Test of the War Between the Montreal Liability Convention's Article 21(2)(A) and 21(2)(B)?*, 68 J. AIR L. & COM. 699, 703–08 (2003) (discussing some of the new legal liabilities posed under the Montreal Agreement and the ratification process).

would be operating under the Warsaw Convention while others would be operating under the Montreal Convention. The United Nation's civil aviation agency has adopted the Montreal Liability Convention as a replacement of the Warsaw Convention.<sup>33</sup> Until ratified by Congress, the United States will enforce the Montreal Liability Convention as a contract agreement among the airlines, and by the DOT<sup>34</sup> as an agency regulation upon the filing of a new tariff by the individual airlines.<sup>35</sup> U.S. airlines have contracted among themselves and have operated under the terms of the treaty.<sup>36</sup> In essence, although Congress has not yet ratified the Convention, the actions of airlines have made the treaty the de facto law of U.S. aviation. The most controversial of the new agreement provisions are the treaty's new damage recovery rules and the new choice of law rules.<sup>37</sup>

The Montreal Liability Convention could have major effects on the airline industry, specifically on its economic structure as a high fixed-cost oligopoly. It could also influence the financial considerations of the market as airline stock prices respond to incidents exposing airline firms to liability.

#### IV. ECONOMIC STRUCTURE OF THE U.S. AIRLINE INDUSTRY

In 2001, commercial airlines carried nearly 450 million passengers, an increase of approximately 250% since the industry deregulated in 1978.<sup>38</sup> Despite this long-term total financial growth, the number of passenger originations only increased at an annual rate of about 1.5% from 1997 to 2001.<sup>39</sup> This increase was due to

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33. Christopher J. Chipello & Anna Wilde Mathews, *Accord is Reached to Increase Liability, Remove Low Caps for Plane Accidents*, WALL ST. J., June 1, 1999, at B8.

34. Agreement Relating to Liability Limitations of the Warsaw Convention, Nov. 12, 1996, 1996 DOT Av. LEXIS 769 (making the agreements effective in the United States over domestic airlines).

35. Jeffery C. Long, *The Warsaw Convention Liability Scheme: What It Covers, Attempts to Waive It and Why the Waivers Should Not Be Enforced Until the Airlines Are Financially Stable*, 69 J. AIR L. & COM. 65, 86 (2004).

36. See Weber & Jakob, *supra* note 30.

37. Robert F. Hedrick, *The New Intercarrier Agreement on Passenger Liability: Is it a Wrong Step in the Right Direction?*, 21 ANNALS AIR & SPACE L. 135, 150-52 (1996).

38. U.S. DEP'T TRANS., BUREAU OF TRANSPORTATION STATISTICS, HISTORICAL AIR TRAFFIC DATA MONTHLY: YEAR 2002 (2003), [http://www.bts.gov/programs/airline\\_information/air\\_carrier\\_traffic\\_statistics/airtraffic/monthly/2002.html](http://www.bts.gov/programs/airline_information/air_carrier_traffic_statistics/airtraffic/monthly/2002.html).

39. *Id.*



economic and exogenous factors such as industry consolidation, the increasing prevalence of online ticketing, and the entrance of low-fare carriers that coincided with particular force to buffet the airline industry.

As a result, virtually every major U.S. carrier is or has recently been under bankruptcy protection, or has claimed to be on the verge of bankruptcy. This suggests that the airlines' problems result from industry-wide events and not from an individual company, company policy, or decision. In 2005, four of the six major carriers, US Airways, United, Delta, and Northwest, were subject to Chapter 11 bankruptcy protection. However, airlines have limited ability to increase fare prices to compensate for these additional costs and lost opportunities. For example, when fares reach a particular price, many travelers, especially cost-sensitive consumers, choose a less expensive substitute or forego travel altogether. Additionally, the major carriers, or "legacy" carriers, must compete with technological substitutes, such as videoconferencing and other advanced communications technology that make air travel less necessary for business travelers.

As an oligopoly, the U.S. airline industry was especially susceptible to instability caused by these and other factors. If the Montreal Liability Convention allows for quick recovery at a known dollar value, it will provide a measure of stability within the industry based on the ability of the airlines to calculate and insure against injury for international air crashes. However, if the Montreal Liability Convention opens the door to unlimited liability, then it provides far less protection than the Warsaw Convention.

#### V. SEPTEMBER 11 AND THE ECONOMIC STRUCTURE OF THE U.S. AIRLINE INDUSTRY<sup>40</sup>

In previous studies, researchers investigating the impact of accidents and crashes on air passenger demand have found that catastrophic accidents through the late 1980s had little effect, if any, on airline demand. The attributions of the effects they did find were

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40. See generally Rose M. Rubin & Justin N. Joy, *Where Are the Airlines Headed? Implications of Airline Industry Structure and Change for Consumers*, 39 J. CONSUMER AFF. 215 (2005) (presenting an in-depth discussion of the economic-related effects of recent changes in the airline industry).

difficult to distinguish from other factors that could have caused a shift in demand.<sup>41</sup> The researchers also found minimal evidence of cross-impact from one airline's crash on consumer demand for other airlines. This paradigm changed dramatically in the post-September 11 era where a more lasting and widespread impact was imposed on airline demand.<sup>42</sup> For example, Harumi Ito and Darin Lee found the attacks of September 11 had a substantial impact on long-term U.S. airline demand.<sup>43</sup> In separating the persistent and ongoing components of the large post-September 11 decline in demand, Ito and Lee found an initial transitory negative demand shock of over 30%<sup>44</sup> and an ongoing negative shift in the demand for commercial air services of about 7.4%.<sup>45</sup> They also found that structural demand shock accounted for over 90% of the consequent weakness in domestic airline demand.<sup>46</sup> Ito and Lee's study demonstrates the ways in which the U.S. airline industry is vulnerable to a catastrophe like the attacks of September 11.

#### *A. Economic Vulnerability of the U.S. Airlines*

The economic structure of the airline industry was a primary contributor to the instability U.S. airlines experienced both before and after September 11. The airline industry has an oligopoly structure in which a limited number of firms dominate the industry. Firms in an oligopoly have the market power to set or alter prices for their products by establishing output levels. In theory, oligopolies may reap higher profits than more competitive firms. However, because airlines operate in a market system of interdependent firms with substitutable outputs, they are extremely vulnerable to atypical business circumstances and even the slightest price-cutting or other attempts by competitors to increase market share.

The standard measure of oligopoly market power is the industry concentration ratio, which measures the market share of the largest

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41. Severin Borenstein & Martin B. Zimmerman, *Market Incentives for Safe Commercial Airline Operation*, 78 AM. ECON. REV. 913, 913-35 (1988).

42. Harumi Ito & Darin Lee, *Assessing the Impact of the September 11 Terrorist Attacks on U.S. Airline Demand*, 57 J. ECON. & BUS. 75, 77 (2005).

43. *Id.* at 94.

44. *Id.* at 90.

45. *Id.* at 92.

46. *Id.*

firms in the industry in relation to the size of the entire market.<sup>47</sup> In 2001, the six major airlines controlled nearly 70% of the U.S. passenger market. The largest low-fare airline, Southwest, commanded an additional 12%, leaving only 20% of domestic passengers among the remaining smaller carriers.<sup>48</sup> The Herfindahl-Hirschman Index (HHI), an alternative approach to assess market power, gives a broader measure of dispersion by accounting for the market share of each firm rather than the combined market share of the largest firms.<sup>49</sup> In 2001, the airline industry had an HHI of 1233 (based on total operating revenue data of the top twenty airlines), with the total HHI of the six largest airlines equal to 1282.<sup>50</sup> For reference, the U.S. Department of Justice generally prohibits mergers in an industry with an HHI concentration above 1,000 if the merger will increase the industry HHI by 100 points.<sup>51</sup>

A critical characteristic of oligopolistic industries is the high-fixed cost generated by the large capital investment necessary to build capacity. This is clearly the case for the airline industry with approximately 75% of its cost structure fixed. Except during periods of above average demand, there is simply too much capital in the industry to be used effectively. As a result, the airlines appear incapable of earning an economic profit over the long-term under current market conditions.<sup>52</sup> Only in the best economic times can the airline industry produce sufficient revenues to cover total fixed costs<sup>53</sup>—a fact that does not bode well for the airlines in the post-September 11 business environment.<sup>54</sup> An industry-wide reduction

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47. See generally BRADLEY R. SCHILLER, *THE ECONOMY TODAY* 535–60 (9th ed. 2003) (giving an explanation of an oligopoly market structure).

48. AIR TRANSPORT ASS'N, 2002 ATA ANNUAL REPORT 18 (2003), <http://www.airlines.org/NR/rdonlyres/821E9AE0-61F8-4ABF-A322-49062F0C22D6/0/2002AnnualReport.pdf>.

49. See Stephen A. Rhoades, *The Herfindahl-Hirschman Index*, 79 FED. RES. BULL. 188, 189 (1993) (demonstrating that a higher HHI indicates greater industry concentration; for example, if an industry has only one firm the HHI will be 10,000).

50. AIR TRANSPORT ASS'N, *supra* note 48, at 19.

51. Rhoades, *supra* note 49, at 189; see also SCHILLER, *supra* note 47.

52. Justin Pettit & Kevin Murphy, *Era of the MegacARRIER*, 237 AIRFINANCE J. 32, 36 (2001).

53. *Id.*

54. See Richard J. Newman, *The New Flight Plan*, NEWSWEEK, Sept. 15, 2003, at 34–36 (stating that in 2003 holding areas parked almost 600 planes or 15% of the U.S. commercial airline fleet, making the supply of seats 6% less than five years earlier).

of capital and fixed assets is likely necessary to achieve long-term economic viability. Presently, only industry consolidation seems likely to accomplish this goal.<sup>55</sup>

Once capital investment and flight volume are developed, the number of passengers may increase at a nominal marginal cost for each flight. This provides a substantial incentive for airlines to fill every seat because any unfilled seat becomes a perishable good and therefore lost revenue. Economies of scale, or those with decreasing average costs, provide further incentive to fill seats, generating a maze of pricing strategies to sell the maximum number of seats on each flight.<sup>56</sup> Thus, the financial impacts of the number of empty seats caused as an after-effect of September 11 are apparent.<sup>57</sup>

However, oligopolies are not monopolies and entry is still possible even with airline economies of scale and the high entry costs associated with aircraft acquisition and utilization. The growth of low-fare carriers provides evidence that the industry is open for competition. New market entrants can immediately erode a dominant carrier's market share even at large hub airports. Additionally, the rising costs of insurance and fuel have further reduced the airlines' ability to compete based on price.<sup>58</sup> This indicates that the airline industry is inherently unstable—a problem typical of industries with high capital costs.<sup>59</sup> This appears to be the competitive paradigm for the airline industry in 2006.<sup>60</sup> Although

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55. See Pettit & Murphy, *supra* note 52, at 36 (arguing that mergers allow airlines cost savings through measures such as internal economies of scale [e.g., route optimization to increase load factors], more efficient use of existing aircraft fleets, increased fleet utilization, decreasing maintenance costs, and leveraging overhead costs for lower operating [marginal] costs through synergies).

56. See Peter Coy, *Deregulation: Innovation vs. Stability*, BUS. WK., Jan. 28, 2002, at 108.

57. To achieve economies of scale, the major airlines utilize a form of "virtual consolidation" through code-share alliances that permit ticketing passengers on competing airlines to expand routes and create new connecting flight links. This practice, also known as "competitive cooperation," while aimed at passenger retention, is also likely to reduce flights to smaller or weaker hubs. See Joe Sharkey, *Business Travel: On the Road; Major Change Foreseen in Air Travel*, N.Y. TIMES, Oct. 7, 2003, at C12.

58. AIR TRANSPORT ASS'N, *supra* note 48, at 12.

59. Coy, *supra* note 56.

60. Airlines build excess capacity during macroeconomic expansion; however, when industry sales decline, they compete for a shrinking passenger base. The lowest cost airlines are the most likely survivors, often generating mergers or acquisitions and a reduced, possibly more competitive, industry. See Yochi J. Dreazen, Greg Ip & Nicholas Kulish, *Big Business:*

consolidation of market power, possibly into a “Big Three” or “Big Four” scenario, may lead to a decline in service and increased prices, it is unlikely the airline industry will be able to maintain its current state.<sup>61</sup>

While there is an obvious need for industry-wide change, any significant or fundamental shift from the current airline industry structure will likely take years. Given its history of pro-cyclic swings,<sup>62</sup> this industry might never achieve true long-term stability. Thus, a major catastrophic event, such as the attacks of September 11, can potentially spin the entire airline industry into chaos, even though only a single carrier is directly affected. This fragility underscores the need for an efficient limited liability regime as a way to protect the airline industry from further detriment by placing limits on liability.

### *B. Evidence of Increasing Instability*

Given that airlines have endured three waves of dramatic change and restructuring since the late 1970s, the airline industry desperately needs a limited liability regime to protect it from the possibility of an entirely new genre of air accidents—intentional terrorist attacks. Balancing on the edge of profitability, it would take little to push the U.S. airline industry over the edge.

#### *1. The dramatic waves of change and restructuring*

The first wave of dramatic change and restructuring occurred after deregulation, which produced new fare competition, industry expansion, and the development of the hub-and-spoke system. The second wave occurred as industry consolidation swept through the U.S. airline industry in the late 1980s.<sup>63</sup> Airlines now confront a third wave of structural changes, arising primarily because of the severe and costly security measures resulting from September 11 and the new online ticket procurement revolution. Furthermore, the

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*Why the Sudden Rise in the Urge to Merge and Form Oligopolies?*, WALL ST. J., Feb. 25, 2002, at A1.

61. Paul Mann, *Restructured Economy Tightens Merger Vise*, 154 AVIATION WK. & SPACE TECH. 45, Feb. 5, 2001, at 45.

62. Ito & Lee, *supra* note 42.

63. E. Han Kim & Vijay Singal, *Mergers and Market Power: Evidence from the Airline Industry*, 83 AM. ECON. REV. 549, 550 (1993).

emergence of low-fare carriers also contributed to the structural changes of the airline industry. All of these factors appeared at a time when airlines confront commodity-like thin profit margins with little ability to raise prices in a pricing environment increasingly dominated by on-line purchasing.

Numerous factors led to the third wave of structural changes to the airline industry. For example, on-line purchases create major problems because the elasticity of demand for leisure travel airfares, which comprise nearly 85% of all airline tickets purchased,<sup>64</sup> is a relatively high 2.4%.<sup>65</sup> Thus, a 10% fare increase has the potential to induce a 24% decline in sales because airline consumers are highly responsive to price changes and most choose the lowest fare available regardless of the airline. In contrast, the demand for business travel has traditionally been an inelastic 0.1%, and the decline in business traffic puts profitability at risk.<sup>66</sup> One of the long-term effects of September 11, when coupled with the increasing number of travel substitutes and travel delays, is a decrease in the travel buyers' desire to fly.<sup>67</sup> Thus, while flying is still statistically one of the safest forms of travel, consumers may respond to accidents by decreasing their demand for air travel.<sup>68</sup>

The largest factor affecting the third wave of structural changes was the September 11 terrorist attacks that weakened an already feeble economic structure. The Montreal Liability Convention could help strengthen the economic structure, but may not be enough to protect it against another catastrophe. However, even before the devastating terrorist attacks, the airline industry was experiencing the effects of the economic slowdown that began in early 2000. The airlines continued to languish following the terrorist attacks, despite receiving \$5 billion in government grants.<sup>69</sup> Thus, the market for air

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64. Shawn Tully, *From Bad to Worse*, FORTUNE, Oct. 15, 2001, at 118.

65. PATRICK L. ANDERSON ET AL., THE UNIVERSAL TUITION TAX CREDIT: A PROPOSAL TO ADVANCE PARENTAL CHOICE IN EDUCATION 58 (1997), <http://www.mackinac.org/archives/1997/s1997-04.pdf>.

66. *Id.*

67. Paul Bedard, *Washington Whispers: A Tourism Czar?*, U.S. NEWS & WORLD REP., June 16, 2003, at 7.

68. See Wallace N. Davidson III, P.R. Chandy & Mark Cross, *Large Losses, Risk Management and Stock Returns in the Airline Industry*, 54 J. RISK & INS. 162, 170 (1987).

69. Gary S. Becker, *The Airline Bailout Sets a Bad Precedent*, BUS. WK., Nov. 26, 2001, at 28.

travel has changed in unanticipated ways that indicates continual slow growth in passenger travel, even without a new terrorist incident.<sup>70</sup> Domestic passenger travel is unlikely to reach the 2000 level of almost 700 million until 2008.<sup>71</sup>

In an industry teetering on the brink of insolvency, any additional terrorist attack would push the industry over the financial edge even with increased passenger traffic. In light of the current unstable foundation of the airline industry, the loss of the old protection from unbounded liability claims once provided by the Warsaw Convention could serve as a major destabilizing factor for airlines. Without a limited liability regime in place, such as the one ushered in by the Montreal Liability Convention, a catastrophic event might eliminate an entire set of airlines. This could reduce the industry to turmoil with disruptions to the transportation infrastructure that could be crippling on a national and international scale.

### *C. Financial Consequences of Industry Structure and September 11*

The airline industry has historically been both seasonal and highly cyclical in nature with demand declining during macroeconomic downturns and rising again during the next upswing.<sup>72</sup> However, this pattern has not repeated following the events of September 11. Further, following September 11, the serious economic factors noted above aligned with major declines in airline demand to generate the most severe deterioration in stock prices ever witnessed in the airline industry that in turn added to a financial crisis unlike any previously experienced.<sup>73</sup>

There are three ways that airlines and their stockholders can suffer financially from an airline crash: (1) loss of the aircraft; (2) liability losses due to death and injuries of passengers and damage to property; and (3) loss of future passenger demand due to safety

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70. See Richard J. Newman, *The New Flight Plan*, U.S. NEWS & WORLD REP., Sept. 15, 2003, at 34 (demonstrating that recession and slow economic growth has reduced the business travel base of the airlines and rising unemployment has increased consumer hesitancy to purchase leisure travel).

71. Sharkey, *supra* note 57.

72. Ito & Lee, *supra* note 42, at 76.

73. *Id.* at 79.

fears.<sup>74</sup> In this study, the focus is on the liability losses due to death and injuries and whether the market distinguishes between the effect of unlimited domestic liability and limited international liability that traditionally reduced financial liabilities following an airline crash.

#### VI. EVENT STUDIES DEMONSTRATING THE POTENTIAL IMPACT OF ANOTHER SEPTEMBER 11 TYPE TERRORIST ATTACK

The impact of crashes on airline stock prices has been intensively analyzed through event studies, a methodology common in financial economics literature.<sup>75</sup> The event study is based on the efficient markets hypothesis, i.e. that markets operate efficiently if there is sufficient and accurate information for decision-making and if there is mobility of resources. An event study examines the pattern of daily stock returns to determine whether a significant stock price reaction occurs in the days immediately surrounding the crash event after subtracting the expected component of return. This calculated differential constitutes “excess” return, or the component of the return attributable to firm-specific occurrences, such as an airline crash, rather than aggregate market influences. Thus, the excess return is the focus of analysis in the event methodology and the significant remaining return is attributed to the impact of the crash on stockholder value. Usually, the impact on shareholder wealth is concentrated on the actual event day itself because financial markets respond rapidly to events that might affect a firm’s future financial performance.

##### *A. Domestic Economic Response to Air Disasters*

In *Air Disasters and Their Financial Effects on the International Aviation Industry: Justification for the Warsaw Convention?*, Moore and Ferris compare the impact of a domestic air crash and an international disaster on the stock of U.S. air carriers.<sup>76</sup> They examined fatal accidents from 1962 to 1985 and found statistically significant effects of crashes on the stock of the involved airline, but

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74. Davidson, Chandy & Cross, *supra* note 68, at 163.

75. See Edward R. Bruning & Ann T. Kuzma, *Airline Accidents and Stock Return Performance*, 25 LOGISTICS & TRANSP. REV. 157, 158–59 (1989) (discussing the value of applying an event study approach to the economic impact of airline crashes).

76. Moore & Ferris, *supra* note 26, at 114–18.



not on other airlines.<sup>77</sup> In examining international air crashes, Moore and Ferris found an excess return of -1.02%,<sup>78</sup> implying that shareholders of the airlines involved in the accident incurred a 1% loss of wealth on the day of the crash, but on subsequent days excess rates of return vary without statistical significance. For domestic air crashes, they found a significant excess return of -2.36% on the event day. This indicates that shareholders in firms experiencing a domestic crash, lose 2.36% of their equity value on the crash date, but do not experience significant gain or loss on the following days.<sup>79</sup>

These results indicate that the stock market's response to an airline crash is much more pronounced in the case of domestic accidents than international disasters. Thus, the potential liability losses from an international crash are lower because of the liability limitations imposed by the Warsaw Convention. The stock market distinguished between potentially unlimited liability associated with a domestic crash and the limited liability imposed by international treaty. A model of stock prices contends that one component of the current value of a stock is the discounted value of its future earnings.<sup>80</sup> Because of the associated losses due to liability, an airline crash will likely reduce the level of future earnings for the firm. This will result in lower current stock prices. A decline in stock price and earnings will be greater for a domestic crash because there are no liability limitations. A declining share price will produce negative rates of return, indicating that the market anticipates a greater impact on earnings from a domestic crash and as a result, more severely discounts the value of the firm's equity.<sup>81</sup>

Prior to the September 11 attack, Moore and Ferris concluded that the Warsaw Convention successfully preserved airlines from destructive liability losses incurred from an international air crash. Shareholder wealth is subject to a negative excess return that is 134%

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77. *Id.* at 114–18.

78. *Id.* at 117.

79. *Id.*

80. *See generally* ZVI BODIE, ALEX KANE & ALAN MARCUS, *ESSENTIALS OF INVESTMENTS* 415–23 (Irwin 1993).

81. *See* JOHN MARTIN, STEPHEN COX & RICHARD MACMINN, *THE THEORY OF FINANCE: EVIDENCE AND APPLICATIONS* 263–85 (Dryden Press 1987) (discussing a review of major studies using the daily rates of return rather than the level of stock prices to examine the impact of information-laden events on shareholder wealth).

more in a domestic accident, which is outside of the purview of the treaty, than in an international crash.<sup>82</sup>

In *On the Performance of Airlines and Airplane Manufacturers Following Aviation Disasters*, the authors—using the event study methodology—found an average-stock price decline of 2.8% within one trading day of a publicized accident, from 1962 to 2003.<sup>83</sup> They also found the airline stock's abnormal performance was negatively related to the firm size and the number of fatalities resulting from the accident.<sup>84</sup> Initial stock price decline, followed by further decline the following week, indicates a violation of the efficient market hypothesis. The hypothesis states that stock prices should respond immediately to an announcement and that delayed price declines are unexpected.<sup>85</sup> Further, the authors note that disasters occurring in the United States and those caused by criminal activity, particularly the September 11 terrorist attacks, cause significantly larger stock value declines in the days following the event than those occurring outside the United States.<sup>86</sup> They also found that enhanced media coverage for airline disasters, as well as crashes with more than 100 fatalities, caused significantly larger price declines.<sup>87</sup>

### B. Additional Event Studies

Uninsured losses may largely drive decline in airline stock value because airlines insure themselves against many costs of a crash such as loss of passenger demand following a crash, higher insurance premiums, and greatly enhanced safety costs. The costs of a crash could generate an externality effect in terms of the impact that an accident of one airline has on the equity values of other airlines.<sup>88</sup> In another pre-September 11 study, Severin Bornstein and Martin

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82. *Id.*

83. Thomas John Walker, Dolruedee Jum Thiengham & Michael Yi Lin, *On the Performance of Airlines and Airplane Manufacturers Following Aviation Disasters*, 22 CANADIAN J. ADMIN. SCI. 21, 21–34 (2005).

84. *Id.* at 29, 32.

85. David A. Carter & Betty J. Simkins, *The Market's Reaction to Unexpected, Catastrophic Events: The Case of Airline Stock Returns and the September 11th Attacks*, 44 Q. REV. ECON. & FIN. 539, 555 (2004). This finding is consistent with the Carter and Simkins' post-September 11 findings. Walker, Thiengham & Lin, *supra* note 83, at 32.

86. *Id.*

87. *Id.*

88. Borenstein & Zimmerman, *supra* note 41, at 920.

Zimmerman measured shareholders' financial loss due to decreased consumer demand in the wake of airline accidents.<sup>89</sup> They found that crashes were associated with a statistically significant average loss in equity value of 0.94% (or \$4.5 million) on the first trading day.<sup>90</sup> These findings are quite similar to the effects measured by Moore and Ferris.

Bornstein and Zimmerman concluded that information about a crash is fully absorbed in the stock price on the first trading day following the accident. They assert, "[T]he market forms an unbiased estimate of significant negative consequences as soon as the crash becomes known."<sup>91</sup> They also note minimal evidence for cross-impacts from one airline's crash on the demand for other airlines, which indicates that the market does not distinguish the losses of an individual company from that of the industry as a whole.

Jean-Claude Bosch, E. Woodrow Eckard, and Vijay Singal also found in a pre-September 11 study that the bulk of the stock price reaction occurs on the event day (-1.17%) and the following day (-0.93%).<sup>92</sup> They also found a distinct product market reaction: consumers responded to crashes by switching to rival airlines or by reducing flying in general.<sup>93</sup> They found a positive relationship between non-crash airline stock reactions and the degree of market overlap with the crash airline.<sup>94</sup> Other pre-September 11 researchers confirm that investors responded almost immediately to accident reports, that the abnormal return patterns adjusted soon after the event, and that there is minimal cross-airline impact.<sup>95</sup> However, this apparent rule of airline finances changed dramatically in the post-September 11 era, which imposed a more lasting impact on airline demand.<sup>96</sup>

David Carter and Betty Simkins examined airline stock returns following the September 11 attacks using multivariate regression

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89. *Id.* at 923.

90. *Id.*

91. *Id.* at 924.

92. Jean-Claude Bosch, E. Woodrow Eckard & Vijay Singal, *The Competitive Impact of Air Crashes: Stock Market Evidence*, 41 J.L. & ECON. 503, 510 (1998).

93. *Id.* at 515.

94. *Id.*

95. *See supra* text accompanying note 42.

96. *See supra* text accompanying note 42, at 94.

analysis and a sample of U.S. airlines, international airlines, and airfreight firms.<sup>97</sup> They found abnormally high negative returns for domestic airlines and smaller negative returns for international carriers and airfreight firms.<sup>98</sup> They further found that the market distinguished among airlines based on their cash reserves—an indication of the particular airline’s ability to withstand liability and/or extensive declines in demand.<sup>99</sup> Carter and Simkins concluded that following the September 11 crisis, the financial markets supported rational pricing, and market participants believed the long-term consequences of the attacks were more significant for airlines involved in international travel.<sup>100</sup>

## VII. CONCLUSION

The oligopoly structure, barriers to entry, and high fixed costs of the airline industry make it highly susceptible to the impact of decreased demand and liability costs following major airline crashes. These factors, combined with the cyclic instability of the airline industry, became particularly critical following the unprecedented events of September 11 and have had a lasting effect on the stability and permanence of some of the largest firms in the industry.

Airlines previously under the Warsaw Convention exacerbated this instability in 1999 when they agreed to allow liability claims for victims to be limited only by the laws of the country where the victims resided. This agreement embodied a substantial shift from the original 1929 agreement that limited damage claims for accidents occurring on international flights to \$8,300 and the 1966 amendment raising the liability limit to \$75,000. However, liability for domestic flights, which are not covered by the Warsaw Convention, remained subject to U.S. liability laws.

Despite the number of studies on the reaction of airline stock value to crashes, the pre- and post-September 11 analyses remain unique among those located in separating the impacts of domestic from international crashes. The findings of both support that this distinction is critical to appraising the anticipated financial effects of

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97. Carter & Simkins, *supra* note 85.

98. *Id.* at 546.

99. *Id.* at 553–54.

100. *Id.* at 555.

the 1999 Montreal Liability Convention on airline liability. As a post-September 11 analysis, the findings in *On the Performance of Airlines and Airplane Manufacturers Following Aviation Disasters* particularly indicate that the Montreal Liability Convention will likely diminish the liability impacts of airline crashes on airline financial stability.

The economic and financial analyses of the effects of a crash on an airline company and its shareholders, lead to several conclusions about the long-term impacts of the Montreal Liability Convention. First, the Montreal Liability Convention met the objective of the Warsaw Convention: to preserve airlines from financial destruction—as measured by the stock market response—resulting from an international air crash. Second, in the post-September 11 world, it appears that the rational markets hypothesis does not hold, indicating that the negative effects of an airline disaster are not immediately realized in its stock prices, but continue for an extended period. Third, while the financial impacts of domestic crashes have surpassed those of international crashes in the past, this may change as international accident liability laws are loosened and expanded by the Montreal Liability Convention, especially in instances where international operators presumably cause domestic crashes. Thus, the combination of a realignment of national and international liability laws, coupled with liability limitations, could help stabilize the airline industry as a critical component of national and world transport infrastructure. Without continued progress in this direction, the long-term future of the industry remains problematic.