

Shareholder wealth effects of legislative events: The case of airline deregulation*

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Abstract. This paper presents empirical evidence about the impact on shareholder wealth of legislative events leading to the enactment of the Airline Deregulation Act of 1978. In contrast to prior regulatory event studies, this paper examines not only the final legislative enactment but also the Congressional hearings that preceded it. No significant effect on shareholder wealth is indicated when averaged across all airline firms and all legislative events. Impact of deregulation, however, was expected to be different for trunk airlines than for local airlines. Moreover, market expectations likely changed with the change in the political climate during the course of deregulation deliberations, from an industry financial health emphasis under a Republican (Ford) administration to a consumer welfare emphasis under a Democratic (Carter) administration. We find that trunk airlines experienced significant positive abnormal returns during the Ford administration, but negative abnormal returns during the Carter administration. In contrast, local airlines exhibited significant negative abnormal returns during both the Ford and Carter eras. Systematic risk of both trunk and local airlines also increased with the change in the political climate.

1. Introduction

The Airline Deregulation Act of 1978 liberalized Federal regulation over the airline industry with the expressed intention of promoting competition among airlines. During the five year period beginning in early 1974, when Congressional hearings conducted by the Civil Aeronautics Board (hereafter, CAB) Oversight Committee began, to 1978, when President Carter signed the Act into Public Law, new information was released during legislative deliberations. This paper investigates the shareholder wealth effects of a changing regulatory environment in the airline industry by explicitly examining key

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Congressional hearings that preceded the actual enactment of the law. Since the airline industry prior to deregulation was divided into trunk and local airlines based on their size and routes of operations, we also investigate whether the regulatory events had differential impacts on the two groups. In particular, we document that expectations about wealth impact of deregulation depend on the political climate and also vary systematically across firms. The examination of these differential market reactions to regulatory actions corresponding to changes in the political regime and the treatment of heterogeneity within an industry are the primary contributions of this paper.

Schwert (1981), first suggested the use of the event study methodology traditionally used in the finance and accounting research as a means of identifying regulatory effects on asset prices in securities markets.¹ Subsequently, Maloney and McCormick (1982) were the first to use this methodology to examine the regulatory effects of cotton dust standards. Several researchers have since investigated the impact of other regulatory events using the event study approach.² Spiller (1983) used the same approach to examine two specific events that preceded the legislative deliberations leading to the Airline Deregulation Act of 1978. Using monthly returns, he found no significant stock price reaction to the CAB's allowance of a wide variety of discount fares in March 1966 and their disallowance in April 1973. Michel and Shaked (1984) also used an event study approach to examine the effects of airline deregulation. Using a sample of 14 airlines and monthly stock returns during the seven year period from January 1975 to December 1981, they documented a mild overall positive effect during the period.³

Our focus is primarily on the legislative process that preceded actual enactment. In particular, we examine Congressional hearings, which often involve participation by industry and consumer representatives. Congressional hearings are a key part of all legislative proceedings prior to legislative action. Events such as Congressional hearings that lead up to a legislative act themselves convey information and in a weakly efficient market such information is rapidly impounded into prices. Some of these hearings are also extensively reported in the financial press. These press reports provide considerable information regarding the form and substance of the impending legislative act.⁴ We posit, consistent with an efficient market, that market expectations are revised with the information released at the hearings, rather than at the actual enactment of the legislation. As Brown and Warner (1985) note, the event study methodology is more powerful when the date the expectations change is known with greater certainty.⁵

The rest of the paper is organized as follows. Section 2 describes the history of deregulation deliberations and their likely impact on the airline industry. Section 3 describes the sample data and Section 4 discusses the estimation

procedure. Empirical results are presented in Section 5. Section 6 summarizes and concludes the paper.

2. The Airline Deregulation Act of 1978

2.1. Overview

The Airline Deregulation Act of 1978 involved two important elements. First, rate regulation was relaxed to allow free price competition among airlines. Second, route restrictions were relaxed to permit airlines to operate in any market. Prior to deregulation, the CAB not only restricted entry by firms, but also restricted the number of existing carriers competing in a given market. In general, the trunk airlines operated major long-haul markets and the local airlines were restricted to serve the regional markets. Relaxation in price and route regulation signified major changes in the competitive environment of the industry, and therefore, may be expected to affect future cash flows of airline firms and their capitalized values.

We would thus expect to see price reactions around legislative events that preceded the actual enactment of the Airline Deregulation Act if, in fact, such events altered the market assessment of (a) the future profitability of a particular airline in a deregulated competitive environment and (b) the likelihood of the deregulation legislation being enacted. Representing δ_{ij} as the unexpected change in the market value of firm i consequent to legislative event j , the average shareholder wealth effects across all airlines and over the entire set of legislative events can be specified in the following null hypothesis:

$$(O.A) \quad \sum_{i \in I} \sum_{j \in J} \delta_{ij} = 0$$

where

I: The set of airline firms;

J: The set of legislative events.

2.2. Effect of change in political climate

Although the Airline Deregulation Act became law in 1978, the regulatory process took approximately five years spanning two administrations: Ford administration from 1974 to 1976 and Carter administration in 1977 and 1978.

The Airline Deregulation Act of 1978 was signed by President Carter into law on 24 October 1978 but the movement toward deregulation began much earlier. Even before President Ford's proposed legislation on regulatory

reform titled “The Aviation Act of 1975” was made public in October 1975, The House Subcommittee on Transportation and Aeronautics held a hearing in February 1974 (CIS, H501-24, 1974) to receive a briefing from the CAB personnel concerning the functioning and problems of the CAB.⁶ Following the Senate hearing, and almost concurrently, President Ford was faced with increasing requests for Federal subsidy from airlines to cope with their financial difficulties.⁷ A landmark step toward airline deregulation was taken when President Ford decided to oppose airline bids for federal subsidy and sought other ways to help financially troubled airlines (*Wall Street Journal*, 19 September 1974).⁸ It signalled that federal subsidy for financially distressed airlines might no longer be available.

President Ford’s intention to restructure the airline industry was mentioned in the 1975 Economic Report of the President. The report promised “more freedom for air carriers to raise and lower rates without regulatory interference, greater freedom to enter markets and exit from uneconomic services”. This statement was perceived as one of support for the industry’s financial health.⁹ The Aviation Act of 1975 reflected the Ford administration’s intent to stimulate price competition, eliminate entry barriers and alter the basic function of the Civil Aeronautics Board.¹⁰ Later, Mr. Jim Wright, Chairman of the House Subcommittee on Investigation and Review of the Airline Industry, said in his opening statement that “in striving to achieve these (legislative) objectives, we must continually be aware of the effects which our action will have on the financial health of the industry ...” (CIS, H641-28, 1976). These policy statements were also perceived as support for industry. Mr. Robert Joedicke, a financial analyst with Kuhn Loeb & Co., believed that the attitude of regulators “has clearly changed for the better and we believe we’re (*the airline industry*) in a period of two or three years of sharply improved profitability”. (*Wall Street Journal*, 12 August 1976, italics ours.)

When President Carter took office in January 1977, the momentum for deregulation continued but the mood had changed. Even before Carter took office, his campaign platform endorsed an independent consumer agency (Agency for Consumer Protection) with sufficient muscle to protect the public in regulatory matters, an action that had been opposed by President Ford (*Congressional Quarterly Weekly Report*, 10 July 1976: 1789). Shortly after taking office, President Carter chose the airline industry as the first target in the drive for regulatory reform that was promised in his campaign. In his message to the Congress two months after taking office, he said “whenever it seems likely that the free market would serve the public better we would eliminate government regulation”.¹¹ Instead of submitting an airline deregulation bill of his own, his administration supported legislation written by Senator Edward Kennedy (Democrat, Massachusetts) and Senator Howard

Cannon (Democrat, Nevada). The emphasis in this bill was on consumer interest and job protection rather than the financial vitality of airline firms. Allowing the airlines to compete more vigorously was expected to lead to lower fares and better service for the travelling public (*Wall Street Journal*, 17 March 1977). Mr. Bert Fingerhut of Oppenheimer and Co., a leading analyst of airline stocks, stated that “regulatory changes with a consumerist bent are practically assured in the Carter administration ... they will create an initially negative environment for the industry and ... this will happen sooner than most people expect” (*Wall Street Journal*, 19 November 1976).

Thus, the mood and attitude had changed from one of concern for the financial health of the industry (Ford Administration) to one of concern for consumer interest and better transportation service (Carter Administration). This shift in policy from one of supporting airline firms (*producers*) to one of supporting other interests (*consumers*) is also evidenced in the February 1978 legislation providing for compensation to airline workers if they lost jobs due to deregulatory changes.¹² That political climate affects regulatory policy is well-recognized in the prior literature. In the context of the Interstate Commerce Act of 1887, Gilligan, Marshall and Weingast (1989) provide evidence using incidence analysis that (a) regulation does not always follow the stylized pattern of a concentrated producer group against an undifferentiated diffuse set of customers and (b) the form of regulatory statutes depends critically on the institutions of the legislative choice process. Similar arguments have been made in the context of State Utility Regulation Commissions where the political climate determines the form and substance of the regulation (Sherman, 1989; Dubin and Navarro, 1982). Empirical evidence is also provided by Olson and Trapani (1981) who documented that between 1971 and 1976 (Nixon–Ford Administrations) the distribution of benefits for the airline industry had shifted in favor of producers rather than consumers.

These arguments and empirical regularities are also consistent with the general theory of regulation proposed by Stigler (1971) and Peltzman (1976) according to whom regulation (*de-regulation*) is a device for transferring income to well-organized groups if the groups would return the favor with votes and contributions to politicians. The Stigler–Peltzman theory would predict that regulators will use their power to transfer income from those with less political power to those with more. In the Ford era (Conservatives) we expect more pressure to transfer wealth to big business and in the context of airlines, deregulate the industry in a manner that will be beneficial to the large trunk airlines at the cost of the smaller local/regional airlines. In contrast, in the Carter era (Democrats), we expect more emphasis on not only protecting the interests of the smaller carriers but also the interests of the labor unions and consumers. In this sense, it is likely, that the Ford era regulatory changes

would have been more *pro-producer* oriented, while the Carter era regulatory changes would have been more *pro-consumer* oriented.

In order to examine whether there were systematic differences in the market's response to legislative events associated with different political climates, we specify the following null hypotheses:

$$\begin{aligned} \text{(F.A)} \quad & \sum_{i \in T \& L} \sum_{j \in F} \delta_{ij} = 0 \\ \text{(C.A)} \quad & \sum_{i \in T \& L} \sum_{j \in C} \delta_{ij} = 0 \\ \text{(R.A)} \quad & \frac{1}{M_F} \sum_{i \in T \& L} \sum_{j \in F} \delta_{ij} = \frac{1}{M_C} \sum_{i \in T \& L} \sum_{j \in C} \delta_{ij} \end{aligned}$$

where

F : The set of legislative events during the Ford era;

C : The set of legislative events during the Carter era;

M_F : The number of legislative events during the Ford era;

M_C : The number of legislative events during the Carter era;

T&L : The set of all trunk and local airline firms.

2.3. Differential effects among firms

Prior to deregulation, there were two distinct types of airlines. One was known as *trunk* airlines which were larger airlines catering to long haul and densely travelled routes. A second, known as *local* airlines were generally smaller in size and catered primarily to smaller and less widely travelled routes. It was one of the objectives of regulation to ensure that certain less widely travelled and unprofitable routes were also catered to through route and rate protection. Throughout the legislative process, local airlines had continued to oppose deregulation. They feared that they would be driven out of business once fare and route protection was withdrawn, as they could not compete with the resources available to the larger trunk airlines. The local carriers argued that deregulation would ultimately hurt service to small communities.¹³ Mr. Francesco Lorenzo, the President of Texas International and a spokesperson for the small carriers, predicted that deregulation would produce a "highly concentrated, less competitive system" (Hearing of the Senate Subcommittee on Aviation, 1977). The Chairman of National Airlines, Mr. L.B. Maytag, was also quoted as saying that deregulation would destroy some carriers. (*Wall Street Journal*, 17 March 1977.) A task force formed in 1975 to work out a common industry position had deadlocked primarily because of opposition from smaller airlines. In contrast, United Airlines, then the largest firm in the industry, supported deregulation as early as 1975 when almost all other airlines were opposed to it (*Wall Street Journal*, 31 October 1975). This suggests that

United believed that it would benefit under a deregulatory environment in which it could set prices and choose profitable routes to operate. Given the existing heterogeneity within the industry in terms of routes, rates, and size of operations, it would be expected that some firms will be able to compete more effectively in a deregulated environment while others will not. This would thus lead to some firms benefitting and others losing as a consequence of deregulation. Based on the arguments in the popular press, we therefore posit that, on average, local airlines were more likely to lose and the trunk airlines were more likely to gain under deregulation.

Indeed, Maloney and McCormick (1982) argue that regulatory events may lead to intra-industry transfers of wealth such that not all firms may benefit, even when regulation is industry-sponsored. Spiller (1983) also notes that the interest of the individual companies in the airline industry were not homogeneous and that regulation did in fact benefit some of them. Specifically, Spiller (1983) suggests and empirically documents that “if different firms serve different markets, regulatory change will, on average, affect them differentially”. Moreover, Spiller (1986) advanced the theory that mobility barriers existed within the airline industry, which imposed different costs on different airlines depending upon their relative ability to operate in a deregulated environment. Based on the above arguments, we examine the differential wealth effects, if any, between what were identified as trunk and local airlines in the pre-deregulatory period.

To evaluate this differential effect, we modify our null hypothesis (O.A) as follows:

$$(O.T) \quad \sum_{i \in T} \sum_{j \in J} \delta_{ij} = 0$$

$$(O.L) \quad \sum_{i \in L} \sum_{j \in J} \delta_{ij} = 0$$

$$(O.R) \quad \frac{1}{N_T} \sum_{i \in T} \sum_{j \in J} \delta_{ij} = \frac{1}{N_L} \sum_{i \in L} \sum_{j \in J} \delta_{ij}$$

where

T : The set of trunk airlines;

L : The set of local airlines;

N_T : The number of trunk airlines;

N_L : The number of local airlines.

2.4. *Differential effects within political climates after controlling for intra-industry differences*

Thus far we have argued that differences in the rationale and approach to regulatory changes under the two political regimes, i.e. the Ford and Carter administrations would lead to differential market reactions within a homoge-

neous industry. We have also argued that the airline industry was not homogeneous prior to deregulatory changes being implemented and hence, within a homogeneous political environment of regulation, different members of the industry would have experienced different market reactions, given the structural and operational differences between the trunk and local airlines. Both the above hypotheses in Sections 2.2 and 2.3 are therefore unconditional upon one another. However, based on the arguments proposed thus far, it is reasonable to believe that, in fact, these hypotheses are conditional upon one another. During the pro-producer regime of Ford, we have argued that proposed regulatory changes would be made to benefit the large trunk airlines at the expense of the smaller trunk airlines. In contrast, during the pro-consumer regime of Carter, regulatory changes were to protect the consumer and the labor unions, without consideration of the profitability of the airline industry irrespective of whether it was a trunk or a local airline. We therefore propose the following conditional hypotheses by considering the market reaction to deregulatory events separately for the two airline groups and the two political regimes:

H_F : During the Ford administration the abnormal market reaction to deregulation related legislative events was:

(F.T) positive for trunk airlines and
(F.L) negative for local airlines.

H_C : During the Carter administration the abnormal market reaction to deregulation related legislative events was:

(C.T) negative for trunk airlines and
(C.L) negative for local airlines.

In order to evaluate the differential effects of legislative events conditional on both the competitive ability of firms (trunk versus local) and the different political climates (Ford versus Carter), we specifically test the following null hypotheses:

$$(F.T) \quad \Sigma_{i \in T} \Sigma_{j \in F} \delta_{ij} = 0$$

$$(C.T) \quad \Sigma_{i \in T} \Sigma_{j \in C} \delta_{ij} = 0$$

$$(R.T) \quad \frac{1}{M_F} \Sigma_{i \in T} \Sigma_{j \in F} \delta_{ij} = \frac{1}{M_C} \Sigma_{i \in T} \Sigma_{j \in C} \delta_{ij}$$

$$(F.L) \quad \Sigma_{i \in L} \Sigma_{j \in F} \delta_{ij} = 0$$

$$(C.L) \quad \Sigma_{i \in L} \Sigma_{j \in C} \delta_{ij} = 0$$

$$(R.L) \quad \frac{1}{M_F} \Sigma_{i \in L} \Sigma_{j \in F} \delta_{ij} = \frac{1}{M_C} \Sigma_{i \in L} \Sigma_{j \in C} \delta_{ij}$$

2.5. *Shifts in the systematic risk*

The legislative events leading to deregulation may affect not only the stock returns (as summarized above) but also the systematic risk (beta) of airline firms. Evidence to date suggests that there are significant shifts in the systematic risk of firms after major firm specific events. Ibbotson (1975), for example, examined the price performance of new issues of common stock and found significant changes in beta around the announcement period. Brennan and Copeland (1988), using an approach similar to Ibbotson's, found significant shifts in beta around the announcement of stock splits by firms. Peltzman (1976) also reports that the total and systematic risk for drug stocks and for railroad stocks declined after the industries were regulated. Similar shifts in the riskiness of the firm have also been documented for AT&T following regulatory changes. More generally, Peltzman (1976) posits that risk measures are positively related to deregulation. The variability of profits is expected to increase under deregulation, because increased competition results in higher uncertainty about future cash flows and reported earnings.

Indeed, it was widely perceived that deregulation would significantly alter the available opportunities and performance possibilities of airline firms. Under the consumer-oriented Carter administration, the newly competitive industry's profitability, without the stabilizing effect of fare and route regulation, was likely to fluctuate more with changes in economic conditions. Consequently, the systematic risk of the firms was likely to have increased as deregulation became imminent under the Carter administration. We shall therefore allow for the possibility of a shift in beta during the deregulatory period in our model of stock return generation and then estimate the information effects associated with the deregulatory events under consideration. Such a procedure allows us to test for a shift in beta during the deregulatory period and also the information effects after controlling for the shift in beta. As the certainty of deregulation increased from the Ford era to the Carter era, the uncertainty in future earnings also increased, thus one would expect that the average systematic risk of airline firms during the Carter era would be greater than that during the Ford era.¹⁴ In particular, we hypothesize:
 H_B : The systematic risk of airline firms was higher during the Carter administration than during the Ford administration.¹⁵

3. Data and sample selection

3.1. Airline firms included in the sample

Our sample of firms is drawn from the airline industry defined by the four digit Standard Industrial Classification (SIC) codes of 4511 and 4521. The primary basis of analysis is the daily returns of the sample firms. Data on returns for individual airlines and a market portfolio during the event periods under consideration are obtained from the Center for Research in Security Prices (CRSP) Daily Stock Returns and the Daily Stock Index Files. To be included in the sample, a firm must satisfy the following criteria: (a) it should be listed on the New York Stock Exchange (NYSE) or the American Stock Exchange (AMEX) during the period of deregulatory deliberations from January 1974 to December 1978, (b) it should be a United States airline carrier, (c) it should be a passenger airline, (d) it should not be just a holding company, and (e) data on daily returns should be available on the CRSP Daily Returns file from 1974 to 1978.¹⁶ These criteria left us with a total of 19 firms in the sample. These nineteen airline firms were then classified as trunks and locals based on the Civil Aviation Board's (1978) classification.¹⁷ Table 1 lists the nineteen airlines in the *Annual Industrial Compustat File* that are included in our study, along with their trunk/local classification. We also obtained information on monthly oil prices from the *Commodity Year Book* for the years in our sample period.

3.2. Identification of event dates

In order to measure the stock price effects of the deregulatory deliberations, it is necessary to determine when material information reached the market. The materiality condition is used to identify events in the policy formulation process that may have significantly altered market participants' expectations about the effects of possible outcomes or about the likelihood of any particular outcome or both. We began event identification with the *Wall Street Journal Index* and *Wall Street Journal* articles relating to airline deregulation. We then examined the *Congressional Information Services* (CIS) listings and the *Congressional Quarterly* to determine the legislative history of the Airline Deregulation Act of 1978 and identify event dates relating to Congressional hearings as we posit that material information was transmitted to market participants during that period. Table 2 presents a chronology of the key events in the legislative history of the Act. These 24 events represent the first date of each Congressional hearing during the legislative period spanning 1974 through 1978. Our analysis in the paper is based on the assumption that these 24 events listed in Table 2 represent a material subset of all possible events that

Table 1. The list of airline firms* included in this research

Trunk airlines

1. AMR Corp.
2. Braniff Airways Inc.
3. Continental Airlines
4. Delta Airlines
5. Eastern Airlines
6. National Airlines Inc.
7. Northwest Airlines
8. Pan American World
9. Trans World Airlines
10. UAL Inc (United Airlines)
11. Western Airlines Inc.

Local airlines

12. Alaska Airlines Inc.
13. Frontier Airlines Inc.
14. Hawaiian Airlines Inc.
15. Ozark Airlines
16. Republic Airlines Inc.
- 17A. Saturn Airways
- 17B. Southwest Airlines**
18. Seaboard World Airlines
19. US Air Group Inc.

*The list of airlines is obtained from Annual Industrial Compustat file. The classification of trunk and local airlines is based on *Comparative Financial Review: Trunk Carriers and Local Carriers*, Third Edition, Civil Aeronautics Board, October 1978, in *American Statistical Index*, 1979, 9142-31, 1a and 2a.

**Return data for Southwest Airlines is available only beginning October 1975. Hence, returns prior to this date are those of Saturn airlines which is the predecessor airline.

conveyed information to the market participants regarding the consequences of the proposed regulation. Some 11 events, listed in Appendix 1, were excluded because they relate to small business, air safety, small communities etc. and were judged to be unimportant for investors' expectations about the impact of deregulation.¹⁸

4. Model specification

Following Schwert (1981), Schipper and Thompson (1983), Madeo and PinCUS (1985), and Schipper, Thompson and Weil (1987), we modify the traditional market model and specify a multivariate regression model with one equation for each firm. We make three modifications to the traditional market model, which enable us to more precisely measure the shareholder wealth effects of the legislative events. First, we control for changes in oil prices. Fuel costs accounted for approximately 12% of airlines' operating costs before the oil crisis during 1973, and 20% after that crisis. Thus airline stock returns are sensitive to oil price changes. By isolating the impact of oil price changes on airline stock returns, the stock return effects of the legislative events can be estimated more accurately. Second, during the regulatory change period, several firm specific merger and strike activities took place, which are known to have had a significant impact on the performance of affected firms (see Dennis and McConnell, 1986; Yen, 1987; and Davison, Worell, and Garrison, 1988). Therefore, we also control for the impact of merger and strike events (listed in Appendices 3 and 4) on the stock returns. Third, we allow the systematic risk (beta) to be different over the two administrations. Such a procedure allows us to test for a shift in beta from one political regime to another during the regulatory change process and also obtain a more accurate measure of the legislative event effects. We specify the following model where the firm's stock returns are conditioned on legislative events¹⁹:

$$r_{it} = \alpha_i + \beta_{if}r_{mt}F_t + \beta_{ic}r_{mt}C_t + \sum_{j \in J} \delta_{ij}D_{jt} + \gamma_i G_t + \sum_{k \in K} \mu_{ik} M_{ikt} + \sum_{h \in H} \theta_{ih} S_{iht} + e_{it} \quad \forall i \in I$$

where

r_{it} : Stock return of firm i at time t ;

α_i : Intercept of firm i ;

β_{if} : Systematic risk parameter of firm i during Ford administration;

β_{ic} : Systematic risk parameter of firm i during Carter administration;

r_{mt} : Equally weighted market index at time t ;

F_t : Dummy variable for Ford administration; 1 during Ford administration and zero during Carter administration;

C_t : Dummy variable for Carter administration; 1 during Carter administration and zero during Ford administration;

δ_{ij} : Coefficient that measures the impact of legislative event j on firm i stock return;

D_{jt} : Dummy variable for legislative events; 1 for the period surrounding legislative event j and zero otherwise;²⁰

Table 2. Included legislative events relating to airline deregulation

Calendar date (CRSP date code)	CIS no.	CIS title of publication
74/02/07 (2898)	H501-24	CAB Oversight; Hearing before the Subcommittee on Transportation and Aeronautics
74/11/26 (3101)	H501-32	Policies and Procedures of the CAB; Rate making; Hearing before the Special Subcommittee on Investigations
75/02/06 (3150)	S521-10	Oversight of CAB Practices and Procedures Vol. 1, 2; Hearing before the Subcommittee on Administrative Practice and Procedure
75/10/08 (3319)	H740-7	Aviation Act of 1975; Message from the President
75/10/29 (3334)	S401-15.3	Regulatory Reform – 1975; Hearing on problems of Federal regulation and the need for regulatory reform
76/03/01 (3418)	H641-28	Aviation Economics; Hearing before the Subcommittee on Investigations and Review and the Subcommittee on Aviation
76/04/06 (3444)	S261-22	Regulatory Reform in Air Transportation; Hearing before the Subcommittee on Aviation
76/05/04	H701-5	Future of Aviation Hearing before the Subcommittee on Aviation and Transportation Research and Development
76/05/05 (3464)	H641/14	Reform of the Economic Regulation of Air Carriers; Hearing before the Subcommittee on Aviation
76/11/02 (3591)		Jimmy Carter was elected as President
77/01/13 (3639)	H640-1	Proposed Aviation Act of 1977, Message from the President
77/03/04 (3674)	H640-3	Airline Deregulation, Message from the President
77/03/21 (3685)	S261-33	Regulatory Reform in Air Transportation Part 1, 2, 3, and 4; Hearing before the Subcommittee on Aviation
77/04/18 (3704)	H641-9	Aviation Regulatory Reform, Part 1
77/06/18 (3748)	H641-9	Aviation Regulatory Reform, Part 1 (continued)
77/07/13 (3764)	H261-1	Economic Aspects of Federal Regulation on the Transportation Industry; Hearing before the Task Force on Tax Expenditures, Government Organization, and Regulation
77/09/08 (3803)	H401-1	Airline Deregulation and Aviation Safety; Hearing before the Subcommittee on Government Activities and Transportation

Table 2. Continued.

Calendar date (CRSP date code)	CIS no.	CIS title of publication
77/10/05 (3822)	H641-10	Aviation Regulatory Reform, Part 2
78/02/06 (3907)	S263-1	Amending the Federal Aviation Act of 1958; Recommends passage of S2493 (The Air Transportation Regulatory Reform Act of 1978)
78/03/06 (3926)	H641-18	Aviation Regulatory Reform; Hearing before the Subcommittee on Aviation
78/04/19 (3957)		Considered and passed Senate
78/05/19 (3979)	H643-8	Air Service Improvement Act of 1978; Recommends passage of H.R. 12611 (The Airline Service Improvement Act of 1978)
78/07/31 (4028)	H643-11	Air Service Improvement Act of 1978; Supplemental Report on H.R. 12611
78/09/14 (4060)		H.R. 12611 considered and passed House; Passed vacated and S 2493, amended, passed in lieu
78/10/12	H643-17	Airline Deregulation Act of 1978; Conference report on S 2493
78/10/14		Senate agreed to conference report
78/10/15 (4082)		House agreed to conference report
78/10/24		Presidential statement

Note. Events indicated in bold also appeared in the *Wall Street Journal*.

γ_i : Coefficient that measures the impact of oil price changes on firm i 's stock return;

G_t : Oil price at time t ;

μ_{ik} : Coefficient that measures the impact of merger event k on firm i stock return;

M_{ikt} : Dummy variables for merger events; 1 for period surrounding merger event k and zero otherwise, i.e., it is firm specific in the sense of being equal to one only for the affected firm (s);

θ_{ih} : Coefficient that measures the impact of strike event h (beginning or end of strike) on firm i stock return;

S_{iht} : Dummy variables for strike events; 1 for the period surrounding strike event h and zero otherwise, i.e., as with mergers, this dummy is firm specific in the sense of being equal to one only for the affected firm (s);

e_{it} : Residual of firm i stock return at time t .

The simultaneous effect of environmental changes on all firms in the same industry are likely to result in contemporaneous cross-correlation across the firm-specific equations in our model.²¹ We estimate the above equations, therefore, using the Seemingly Unrelated Regression (SUR) procedure (Zellner, 1962). Since the disturbance covariance matrix is unknown, sample information is used to obtain unbiased and asymptotically efficient estimator of the covariance matrix.²²

5. Empirical results

5.1. Overall effects

Before discussing the results of our specific hypotheses, we first discuss some preliminary findings to provide a perspective on the data.

Using pooled cross-sectional and time series data across airline firms and over the entire deregulatory period, we first estimated the event parameters associated with each of the legislative events listed in Table 2 that are expected to have an impact on the valuation of individual airlines. The summary results are reported in Table 3.²³ Systematic patterns emerge when we examine these parameters together for the trunk or the local airlines, and the Ford or the Carter administrations. On average, the local airlines had negative abnormal returns during both the Ford and the Carter administrations, consistent with the fears of the locals that they may not be able to survive fierce competition from the trunks without regulatory protection. The trunks also had a negative reaction on average, but the average losses for the trunks (-0.00063) are less than the average losses for the locals (-0.00205). These negative returns are also consistent with the argument that deregulation was likely to reduce airfares, and hence would affect future firm profitability.

5.2. Tests of null hypotheses

Table 4 presents the tests results for each of the individual hypotheses stated in Section 2, from a firm by firm estimation of event coefficients using the SUR approach. We cannot reject the null that the mean effect over *all* critical events during the legislative period and over *all* airlines (trunks and locals) is equal to zero, the F-value being 1.8643. Consistent with much of the earlier research on the impact of regulatory events on stock prices, we find that there is no perceptible difference at the aggregate level ($p = 0.1721$, two-tail).

We are also unable to reject the null that the mean effect across all events during the legislative period for the trunk airlines was zero ($p = 0.6315$). For

Table 3. Average impact of legislative events on airline stock returns

	Mean δ_{ij}	Median δ_{ij}	Proportion positive
During the entire legislative period (24 events)			
(1) $\delta_{ij}, \forall i \in T \& L, j \in F \& C$	-0.00123	-0.00170	193/456=42%
(2) $\delta_{ij}, \forall i \in T, j \in F \& C$	-0.00063	-0.00098	117/264=44%
(3) $\delta_{ij}, \forall i \in L, j \in F \& C$	-0.00205	-0.00207	75/192=39%
During the Ford administration (8 events)			
(4) $\delta_{ij}, \forall i \in T \& L, j \in F$	0.00171	0.00111	83/152=55%
(5) $\delta_{ij}, \forall i \in T, j \in F$	0.00424	0.00334	59/88=67%
(6) $\delta_{ij}, \forall i \in L, j \in F$	-0.00177	-0.00329	24/64=37%
During the Carter administration (16 events)			
(7) $\delta_{ij}, \forall i \in T \& L, j \in C$	-0.00269	-0.00235	109/304=36%
(8) $\delta_{ij}, \forall i \in T, j \in C$	-0.00307	-0.00267	58/176=33%
(9) $\delta_{ij}, \forall i \in L, j \in C$	-0.00218	-0.00201	51/128=40%

δ_{ij} : The impact of legislative event j on firm i stock return;

T : The set of trunk airlines;

L : The set of local airlines;

F : The set of legislative events during the Ford administration;

C : The set of legislative events during the Carter administration.

the locals however, we reject the null at 10% level of significance ($p = 0.0634$) that the mean effect across all locals over the entire deregulatory period was equal to zero.

These results are also corroborated using an alternative approach, where we estimate our return generating model separately for the trunks and local airlines as a group. The daily portfolio returns for trunks and locals was arrived at by using the mean daily return across airlines in each group. This approach provides a different perspective on how different segments of the airline industry performed on each of the event dates.²⁴ As before, at the aggregate level, we cannot reject the null that the mean effect across *all* the events during the legislative period and across *both trunk and local* airlines is equal to zero, the F-value being 2.1465 (p -value = 0.1430). Moreover, the F-statistic testing for the null hypothesis that the mean effect across all trunk airlines was equal to zero cannot also be rejected (p -value = 0.6261). On the

other hand, we do reject the null hypothesis that the mean market reaction across all legislative events for local airlines is zero (p -value = 0.0567).

Returning to Table 4 and examining all events in the Ford era alone, we cannot reject the null hypothesis of zero effect when all airlines are aggregated together ($p = 0.2878$). When we disaggregate the airlines, however, we reject the null for trunks ($p = 0.0447$). We also reject the null hypothesis that during the Ford era, the mean reaction was the same for the trunks and locals ($p = 0.0150$). This supports our hypothesis that there was a differential market reaction to various legislative proposals across trunks and locals. In contrast, during the Carter era, we reject the null hypothesis of no effect, on average, across all airlines ($p = 0.0228$), but we cannot reject the null that the mean coefficients for the trunks and locals are the same ($p = 0.7112$).

Comparing the Ford and Carter administrations, we find significant differences in mean returns for the Ford and Carter administrations ($p = 0.0251$). We also reject the null hypothesis that the mean effect for the trunks was the same ($p = 0.0052$), but fail to do so for the locals ($p = 0.8138$). These results support our hypothesis that the differential attitude toward deregulation resulted in a differential market reaction for the trunks under the two administrations. The change in the political climate did not significantly alter the initial expectation that local airlines will be worse off in a deregulated environment.

5.3. *Shifts in systematic risk of airline firms*

Panel A of Table 5 indicates that the mean betas of most firms were higher during the Carter era relative to their mean betas in the Ford era. Disaggregating the industry into trunks and locals provides more interesting insights. As can be seen in Table 5, the shifts in beta associated with the locals were much larger than the shifts associated with the trunks, reflecting the greater uncertainty and riskiness for the locals when the removal of the insulating effects of fare and rate regulation became imminent. Statistical tests of mean shifts reported in Panel B of Table 5 demonstrate that there was a significant increase in the systematic risk, both at the aggregate industry level and for the locals. The mean beta shift for the trunk airlines, however, was not statistically significant.

6. Concluding remarks

In this paper, we employed a conditional return generating model to estimate the shareholder wealth impacts of legislative events leading to regulatory change in the airline industry as enacted in the Airline Deregulation Act of

Table 4. Tests of average impact of legislative events

	F-value	Prob. > F
During the entire legislative period		
(O.A) $\sum_{i \in T \& L} \sum_{j \in F \& C} \delta_{ij} = 0$	1.8643	0.1721
(O.T) $\sum_{i \in T} \sum_{j \in F \& C} \delta_{ij} = 0$	0.2300	0.6315
(O.L) $\sum_{i \in L} \sum_{j \in F \& C} \delta_{ij} = 0$	3.4468	0.0634
(O.R) $\frac{1}{N_T} \sum_{i \in T} \sum_{j \in F \& C} \delta_{ij} = \frac{1}{N_L} \sum_{i \in L} \sum_{j \in F \& C} \delta_{ij}$	1.0521	0.3050
During the Ford administration		
(F.A) $\sum_{i \in T \& L} \sum_{j \in F} \delta_{ij} = 0$	1.1300	0.2878
(F.T) $\sum_{i \in T} \sum_{j \in F} \delta_{ij} = 0$	4.0310	0.0447
(F.L) $\sum_{i \in L} \sum_{j \in F} \delta_{ij} = 0$	0.8831	0.3474
(F.R) $\frac{1}{N_T} \sum_{i \in T} \sum_{j \in F} \delta_{ij} = \frac{1}{N_L} \sum_{i \in L} \sum_{j \in F} \delta_{ij}$	5.9208	0.0150
During the Carter administration		
(C.A) $\sum_{i \in T \& L} \sum_{j \in C} \delta_{ij} = 0$	5.1836	0.0228
(C.T) $\sum_{i \in T} \sum_{j \in C} \delta_{ij} = 0$	3.7237	0.0537
(C.L) $\sum_{i \in L} \sum_{j \in C} \delta_{ij} = 0$	2.7014	0.1003
(C.R) $\frac{1}{N_T} \sum_{i \in T} \sum_{j \in C} \delta_{ij} = \frac{1}{N_L} \sum_{i \in L} \sum_{j \in C} \delta_{ij}$	0.1371	0.7112
Ford versus Carter administration		
(R.A) $\frac{1}{M_F} \sum_{i \in T \& L} \sum_{j \in F} \delta_{ij} = \frac{1}{M_C} \sum_{i \in T \& L} \sum_{j \in C} \delta_{ij}$	5.0167	0.0251
(R.T) $\frac{1}{M_F} \sum_{i \in T} \sum_{j \in F} \delta_{ij} = \frac{1}{M_C} \sum_{i \in T} \sum_{j \in C} \delta_{ij}$	7.8014	0.0052
(R.L) $\frac{1}{M_F} \sum_{i \in L} \sum_{j \in F} \delta_{ij} = \frac{1}{M_C} \sum_{i \in L} \sum_{j \in C} \delta_{ij}$	0.0555	0.8138

1978. In particular, we examined the differential impacts of the events during different administrations with different political climates, and for large and small firms with different perceived competitive strengths. We also examined the shifts in systematic risk associated with changes in the political climate.

Several conclusions can be drawn from our empirical results. First, legislative events leading to the Airline Deregulation Act of 1978 contained significant information that was not fully anticipated by the financial market

Table 5.

Panel A: Systematic risks during different administrations

Mean and quartiles	Overall		Trunks		Locals	
	β_{if}	β_{ic}	β_{if}	β_{ic}	β_{if}	β_{ic}
Mean	1.492	1.675	1.801	1.880	1.066	1.395
25%	1.170	1.431	1.549	1.739	0.662	1.041
50%	1.549	1.781	1.863	1.856	1.063	1.377
75%	1.876	1.947	2.068	2.089	1.418	1.847

Panel B: Tests of shifts in systematic risks

	F-value	Prob. > F
1. $\sum_{i \in T \& L} (\beta_{ic} - \beta_{if}) = 0$	3.894	0.048
2. $\sum_{i \in T} (\beta_{ic} - \beta_{if}) = 0$	0.429	0.512
3. $\sum_{i \in L} (\beta_{ic} - \beta_{if}) = 0$	8.974	0.003

 β_{if} Systematic risk of security i during the Ford administration. β_{ic} Systematic risk of security i during the Carter administration.

participants, and the information was revealed gradually as the legislative deliberations proceeded. Second, the shareholder wealth impact of legislative events depends on the perceived ability of a firm to compete in a deregulated environment. During the Ford administration, the trunks were perceived to be in a stronger position and they exhibited positive stock returns while the stock returns were negative for the locals, which were perceived to be in a weaker competitive position. Third, the shareholder wealth impacts of the legislative events during two administrations with different political climates were significantly different. For the trunks, the stock return impacts of the legislative events were positive during the Ford administration, and negative during the Carter administration. The locals exhibited negative abnormal stock returns during both administrations. When the market perceived an unfavorable political climate for the industry, both the trunks and the locals suffered in terms of shareholder wealth effects. This negative effect in the Carter era was further accentuated by the increase in the systematic risk for the airlines with the change in the political climate and an imminent deregulated environment.

Notes

1. The basic idea is that information regarding the nature and likelihood of regulatory changes modifies the market's expectations and beliefs regarding the profitability of each airline implying an upward or downward adjustment of stock prices.

2. Schipper and Thompson (1983) investigated merger related regulations. Rose (1985) examined the incidence of regulatory rents in the motor carrier industry, Chen and Sanger (1985) examined natural gas deregulation in 1978. Hughes, Magat and Ricks (1986) assessed the effects of OSHA changes in cotton dust standards, Schipper, Thompson and Weil (1987) examined motor carrier deregulation and Praeger (1989) examined the Interstate Commerce Act of 1887.
3. They do not present any statistical tests of significance of these effects and attribute changes in share prices to changes in oil spot prices.
4. We emphasize that the effective dates of legislative action are imprecise measures of the event under examination. We also note that only a subset of the Congressional hearings were reported in the *Wall Street Journal*.
5. As an explanation for their findings that the Motor Carrier Act of 1980 met with little market reaction, Schipper, Thompson and Weil (1987) note: "While deregulation was significant to the profitability of established trucking companies, the act itself represented a point in the regulatory change process that was foreseeable on the basis of prior economic events". Explaining their inability to find a significant market reaction to the natural gas deregulation act, Chen and Sanger (1985) suggest that information may have already reached market participants and that stock prices may have already impounded the regulatory effects at the time of the actual enactment.
6. In this hearing, the scope of the CAB's authority to regulate flight schedules was questioned. It is perhaps one of the earliest indications of airline deregulation being on the legislative agenda.
7. Most notable of them was Pan American World Airways. According to the *Wall Street Journal* (26 August 1974), in spite of a \$4.5 million per month federal subsidy that the government paid to Pan Am for carrying mail, Pan Am requested another \$10.2 million per month federal subsidy to overcome its cash shortage and to meet its debt service obligations.
8. According to the *Wall Street Journal* (2 October 1974), a seven-point action plan developed by the Department of Transportation for the financially strapped Pan American World Airways would save the carrier \$150 million in 1975.
9. The Chairman and President of American Airlines, Albert V. Casey, in response to a statement by the Secretary of Transportation, William T. Coleman, noted: "It is very encouraging to hear the Secretary say that airlines should be strengthened through consolidations, an approach we feel should be allowed" (*Wall Street Journal*, 9 April 1975).
10. President Ford had proposed to "end much of the Civil Aeronautics Board powers over airline fares and services ... to convert the tightly regulated airline industry into much more of a free-market business" (*Wall Street Journal*, 5 February 1975).
11. See *Wall Street Journal* (7 March 1977) and CIS, H640-3, *Airline Deregulation, Message from the President of the United States*, 4 March 1977. In his message, President Carter also cited a report by the General Accounting Office that concluded that (i) air fares are between 22 and 52% higher than otherwise would be because of federal regulation, (ii) federally regulated airlines in the U.S. could have operated at lower costs than they did and travellers could have saved \$1.8 billion annually between 1969 and 1974, and (iii) travellers' saving would probably be even higher, since lower fares would encourage greater travel.
12. Additionally, in October 1978, the Senate voted to require airlines to pay for muffling or replacement of noisy aircraft from their own resources instead of from the Federal Airport and Airway Trust Fund.
13. Mr. Edwin I. Colodny, Chairman of the Association of Local Transport Airlines and President and CEO of Allegheny Airlines, said in his testimony that "although in the past the CAB has followed a policy of route strengthening for the smaller airlines to aid them in becoming stronger, not much progress has been made toward closing the gap. As a result there remains a great disparity between the bigger airlines and the smaller carriers. The locals in particular are the disadvantaged ... The local service carriers have

not been prepared by the CAB for the environment that this (deregulation) legislation would create ... The local carriers with their short-haul and less dense market are at a distinct disadvantage". (CIS, H641-18, *Aviation Regulatory Reform*, 1978: 295–300.) For a detailed analysis of the political strategies of different airlines supporting or opposing deregulation, and their subsequent performance see Marcus and Goodman (1986).

14. We note that this expected shift in the systematic risk is not a consequence of political preference, rather the increasing imminence of deregulation.
15. Alternatively, one could allow the beta for each firm to vary from calendar year to calendar year. In substance, we assume that the firm beta is the same during the Ford years (1974–1976): and the Carter years (1977–1978). For our regulatory change years 1974–1978, we have essentially used 2 parameters instead of the five parameters for each of the calendar years, 1974 through 1978. In the absence of a clear knowledge about all of the factors that may be contributing to a shift in firm beta at the turn of each calendar year, intuitively, it makes more sense to think of shifts in firms' riskiness with changes in the political climate. Given inauguration in January, this classification would be very close to the annual classification.
16. Note that the stock return data for Southwest airlines prior to October 1975 correspond to the stock returns for Saturn airlines since Southwest as an airline did not exist prior to that date.
17. The classification of trunk and local airlines is based on *Comparative Financial Review: Trunk Carriers and Local Carriers*, Third Edition, Civil Aeronautics Board, October 1978, in American Statistical Index, 1979.
18. These eleven events pertain to those after January 1974. Appendix 2 provides the parameter estimates for these event dates. It can be seen from Appendix 2 that a test of the null hypothesis that the mean across all these events were equal to zero cannot be rejected (F-statistic = 0.0170, probability value = 0.8962).
19. In the absence of the dummy for Ford and Carter we will be estimating a **single** beta for the firm during the entire regulatory period under consideration.
20. The event window chosen for the analysis in this paper is a seven-day trading window beginning a day before the event date. This structure allows us to reflect the fact that much information may be disseminated *during* the hearings which last on average for three days. Our results are robust to the choice of the end day of the window. The positive effects for trunk airlines during the Ford administration, however, are weaker when the window length is reduced to below five days.
21. Collins and Dent (1984) suggest that when the event times are identical for all firms included in the sample and the firms are concentrated in a few industries, the dependent variable is likely to be cross-sectionally correlated, as are the residuals.
22. We use the SYSLIN procedure in SAS to estimate our model and test our hypotheses.
23. Detailed results for individual events are presented in Appendices 5 and 6.
24. We estimated the two equations using both an OLS and the SUR approach. The coefficients on the individual events and the associated test statistics are reported in Appendix 5. We thank the referee for suggesting this to us.

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Appendix 1. Excluded legislative events relating to airlines

Date (CRSP date code)	CIS no.	CIS title of publication
74/11/07 (3088)	S521-63	Airline Charter Fares; Hearing before the Subcommittee on Administrative Practice and Procedure
75/06/19 (3242)	H721-4	Regulations of Various Federal Regulatory Agencies and their Effect on Small Business; Part 1: Hearing before the Subcommittee on Activities of Regu- latory Agencies
75/08/29 (3292)	H721-8	Part 2
75/11/13 (3345)	H721-13	Part 3
76/04/26 (3457)	S721-23.2	Over-regulation of Small Business; Commuter airlines
76/08/04 (3527)	H721-6.1	Regulations of Various Federal Regulatory Agencies and their Effect on Small Business Part 5; Continuation of Hearing before the Subcommittee on Activities of Regulatory Agencies
76/10/01	H723-8	Role of Small Business in the Air Transportation Industry; the FAA; Report based on Subcommittee on Activities of Regulatory Agencies 1975-76 hearings
76/10/06 (3568)	S721-5	Decline of Supplemental Air Carriers in US, Part 1; Hearing before the Subcommittee on Monopoly
77/02/24 (3668)	S721-33	Decline of Supplemental Air Carriers in US, Part 2; Hearing before the Subcommittee on Monopoly
77/11/29 (3860)	H401-32.5	FAA Operations, Related to Safety and Procurement Manage- ment; Hearing before the Subcommittee on Government Activi- ties and Transportation
78/03/18 (3935)	H641-15	Impact of Interlining on Commuter Airlines; Hearing before the Subcommittee on Aviation

Appendix 2. Estimated coefficients for excluded legislative events

CRSP date code	Mean	F-statistic (p-value)	Number of positive coefficients	Number of statistically significant coefficients
3088	-0.0062	1.4491 (0.2287)	3/19	3/19
3242	-0.0012	0.0544 (0.8156)	8/19	2/19
3292	0.0032	0.1586 (0.6905)	7/19	2/19
3345	0.0042	0.6601 (0.4165)	12/19	0/19
3457	0.0061	1.4348 (0.2310)	14/19	1/19
3527	0.0004	0.0047 (0.9454)	7/19	1/19
3568	-0.0031	0.4951 (0.4817)	4/19	1/19
3668	0.0003	0.0019 (0.9651)	10/19	0/19
3860	-0.0034	0.2672 (0.6052)	4/19	0/19
3935	0.0021	0.1663 (0.6834)	13/19	0/19
$\sum_{i \in T \& L} \sum_{j \in F \& C} \delta_{ij} = 0$		0.0170 (0.8962)		
$\sum_{i \in T} \sum_{j \in F \& C} \delta_{ij} = 0$		0.0067 (0.9350)		
$\sum_{i \in L} \sum_{j \in F \& C} \delta_{ij} = 0$		0.0194 (0.8892)		

Appendix 3. Included merger and acquisition events*

CRSP date code	Calendar date	Event
3139	75-01-22	American Airlines joined Pan American World Airways merger game, becoming third major carrier to study some sort of consolidation; Pan Am said merger studies with TWA and Eastern Airlines are continuing.
3265	75-07-23	Pan Am said merger talks with Eastern were shelved, but tie with American still under study.
4016	78-07-13	Continental Airlines and Western Airlines completed preliminary joint study of possible merger and exploratory discussions have been initiated.
4052	78-09-01	Continental Airlines and Western Airlines agreed in principle to merge by forming new corporation that would be nation's seventh largest airline.
4122	78-12-12	Eastern Airlines offered to buy National Airlines Inc. for \$425 million in competing bid with Pan American World Airways, Inc. and Texas International Airlines Inc.; analysts shocked at Eastern Airlines' efforts, which is viewed as a defensive action.
4046	78-08-24	Pan Am has proposed offer of \$35 a share for stock of National Airlines and has already bought 4.8% of National's common; estimated total price is nearly \$300 million.
4056	78-09-08	Pan Am signed definitive agreement with National Airlines whereby Pan Am would acquire National, which would become subsidiary called Pan American U.S.A.; agreement sets \$41 a share terms; bid totals \$350.1 million.
3064	74-10-04	TWA and Pan Am hold merger discussions, but Pan Am says talks are not serious.
3073	74-10-17	Pan Am and TWA signed route pact; potential annual profit benefits are far in excess of \$50 million initially estimated by two companies.
3724	77-05-16	Wien Air Alaska's directors appointed five-man special committee of non-management directors to 'thoroughly evaluate merits of a merger proposal from Alaska Airlines'.
3776	77-08-01	Alaska Airlines' offer for merger with Wien Air Alaska lapsed July 30 and Alaska Airlines believes 'there does not appear to be any reason' to extend it.
3496	76-06-21	Saturn Airways reached agreement on revised stock swap terms for its proposed acquisition by Transamerica Corp. and subsequent merger of carrier into Trans International Airlines, a Transamerica Corp. subsidiary.
3609	76-12-01	Saturn Airways' shareholders approved Saturn's merger into Trans International Airlines through exchange of 1.2 shares of Transamerica common for each share of Saturn common.

*Merger and acquisition events were identified using *The Wall Street Journal* index. In the case of a series of merger and acquisition events reported in *The Wall Street Journal*, the events that merger or acquisition talk began and ended were included in this study.

Appendix 4. Included strike events*

CRSP date code	Calendar date	Event
3055	74-09-23	Braniff Airlines and its pilots' union signed formal mediation proposal that ended two-day strike.
3089	74-11-08	Braniff Airlines and its pilots' union reached final agreement on new labor contract covering Braniff's 1,300 pilots.
3584	76-10-25	Continental Airlines was struck by Airline Pilots Association as talks collapse; final offer rejected after long negotiations.
3600	76-11-17	Continental Airlines signed contract with Airline Pilots Association, ending strike that began October 23.
3007	74-07-16	Some 1,600 members of Machinists Union struck National Airlines, grounding all 155 departures.
3076	74-10-22	National Airlines and its Machinists Union reached accord in three-month strike; Machinists Union accepts pact, but resumed runs may be delayed further.
3293	75-09-02	National Airlines closed down by strike of some 1,200 flight attendants.
3379	76-01-05	National Airlines' flight attendants ratified contract ending six week strike; agreement provided for wage increases totaling 30% over 46-month life of pact.
3274	75-08-05	Northwest Airlines was struck by pilots as pact collapses; dispute on tentative accord halts most service, new talks sought by mediator.
3371	75-12-12	Northwest Airlines reached agreement on main points of contract with cabin attendants who have been working without labor contract for two years.
3965	78-05-01	More than 1,500 pilots struck Northwest Airlines in a dispute relating to wages, pensions, insurance, and working conditions.
4040	78-08-16	Northwest Airline's pilots strike against line, ended with signing of three-year contract; accord boosts pay, benefits \$51 million over three years.
3361	75-12-08	United Airlines' flights were halted by strike of machinists; stoppage at firm's unit could last into mid-week or later; talks continue.
3371	75-12-22	United Airlines resumed partial schedule of slight operations as union ratified pact providing 28% wage boost.

*The strike events were identified using *The Wall Street Journal* index. In the case of a series of reports related to a strike, the beginning and ending events were included. For example, the event that Continental Airlines was struck by the Airline Pilots Association as talks collapsed (*The Wall Street Journal*, 25 October 1976) is chosen as the beginning event and the event that Continental Airlines signed contract with the Airline Pilots Association (*The Wall Street Journal*, 17 November 1976) is chosen as the ending event.

Appendix 5. Coefficient estimates and tests of average impact of legislative events (using portfolios)

Event date (CRSP date code)	Full model		Without control for strikes and mergers		Without control for Ford, Carter, strikes and mergers	
	Trunk	Local	Trunk	Local	Trunk	Local
2898	0.0218	0.0018	0.0215	0.0018	0.0156	-0.0013
3101	-0.0014	-0.0030	-0.0017	-0.0030	-0.0150	-0.0109
3150	0.0023	-0.0088	0.0021	-0.0088	0.0068	-0.0060
3319	-0.0001	-0.0058	-0.0004	-0.0058	0.0012	-0.0049
3334	0.0044	0.0008	0.0042	0.0009	0.0007	-0.0013
3418	0.0014	0.0022	0.0012	0.0022	-0.0003	0.0012
3444	0.0007	-0.0030	0.0005	-0.0030	-0.0087	-0.0085
3464	0.0057	0.0013	0.0055	0.0014	0.0075	0.0025
CART	-0.0009	0.0019	-0.0008	0.0020	-0.0057	-0.0010
3639	-0.0076	-0.0006	-0.0078	-0.0006	-0.0058	0.0011
3674	-0.0013	-0.0038	-0.0015	-0.0037	-0.0003	-0.0027
3685	-0.0021	0.0012	-0.0023	0.0012	-0.0085	-0.0033
3704	-0.0000	-0.0012	-0.0002	-0.0012	-0.0067	-0.0059
3748	-0.0104	-0.0071	-0.0106	-0.0071	-0.0055	-0.0032
3764	0.0019	-0.0033	0.0016	-0.0033	0.0038	-0.0016
3803	-0.0039	-0.0003	-0.0042	-0.0003	-0.0066	-0.0020
3822	0.0002	-0.0008	0.0000	-0.0008	-0.0059	-0.0051
3907	-0.0058	-0.0007	-0.0006	-0.0007	-0.0029	0.0015
3926	-0.0076	0.0015	-0.0078	0.0016	-0.0018	0.0059
3957	0.0029	-0.0029	0.0027	-0.0028	0.0066	-0.0001
3979	-0.0093	-0.0008	-0.0095	-0.0008	-0.0122	-0.0029
4028	-0.0025	-0.0045	-0.0027	-0.0045	0.0065	.0021
4060	-0.0024	-0.0126	-0.0082	-0.0126	-0.0231	-0.0239
4082	0.0098	-0.0039	0.0096	-0.0038	-0.0252	-0.0299
F-stat	0.0183 (0.8924)	3.8144 (0.0510)	0.2375 (0.6261)	3.6384 (0.0567)	0.2375 (0.6261)	3.6384 (0.0567)
F-stat*		1.7241 (0.1893)		2.1465 (0.1430)		7.9383 (0.0049)

*This is a test of the null hypothesis that the mean of all legislative events across both trunk and local airlines is equal to zero.

Appendix 6. Descriptive statistics of individual legislative event coefficients

Panel A: Trunk airlines					
CRSP date code	Mean	Standard deviation	Quartiles		
			75%	50%	25%
2898	0.02154	0.00845	0.02365	0.02189	0.01700
3101	-0.00165	0.00615	0.00391	-0.00289	-0.00526
3150	0.00212	0.00570	0.00392	0.00076	0.00034
3319	-0.00031	0.00485	0.00487	-0.00196	-0.00297
3334	0.00421	0.00501	0.00703	0.00409	0.00125
3418	0.00126	0.01073	0.00312	-0.00067	-0.00475
3444	0.00050	0.00482	0.00483	0.00207	-0.00568
3464	0.00552	0.00532	0.00946	0.00573	0.00116
3591	-0.00080	0.00840	0.00945	-0.00561	-0.00663
3639	-0.00778	0.00306	-0.00459	-0.00823	-0.00945
3674	-0.00147	0.00462	0.00116	-0.00211	-0.00531
3685	-0.00225	0.00498	0.00307	-0.00193	-0.00698
3704	-0.00016	0.00398	0.00287	-0.00057	-0.00154
3748	-0.01058	0.00588	-0.00774	-0.00948	-0.01558
3764	0.00167	0.00507	0.00362	0.00110	-0.00277
3803	-0.00414	0.00414	-0.00103	-0.00536	-0.00620
3822	0.00006	0.00235	0.00134	-0.00028	-0.00162
3907	-0.00592	0.00679	-0.00373	-0.00709	-0.01023
3926	-0.00775	0.00511	-0.00293	-0.00779	-0.01128
3957	0.00272	0.00414	0.00435	0.00232	0.00002
3979	-0.00942	0.00678	-0.00416	-0.00826	-0.01637
4028	-0.00263	0.00979	0.00236	-5.471E-05	-0.01197
4060	-0.00900	0.00735	-0.00525	-0.00706	-0.01196
4082	0.00977	0.00355	0.01134	0.00991	0.00854
Panel B: Local airlines					
2898	0.00188	0.00983	0.01288	0.00105	-0.00774
3101	-0.00291	0.00831	0.00438	-0.00158	-0.01102
3150	-0.00875	0.00574	-0.00375	-0.00924	-0.01358
3319	-0.00573	0.01006	-0.00241	-0.00698	-0.01126
3334	0.00092	0.00911	0.00808	0.00383	-0.00644
3418	0.00226	0.01641	0.01459	-0.00263	-0.01029
3444	-0.00294	0.00704	0.00172	-0.00467	-0.00820
3464	0.00142	0.01065	0.01072	0.00037	-0.00481
3591	0.00208	0.01366	0.00204	0.00072	-0.00679
3639	-0.00050	0.01007	0.00840	-0.00039	-0.00700
3674	-0.00365	0.00451	-0.00212	-0.00249	-0.00542
3685	0.00128	0.00655	0.00802	0.00175	-0.00542
3704	-0.00112	0.01006	0.00783	-0.00036	-0.00723
3748	-0.00703	0.00902	0.00281	-0.00817	-0.01548

Appendix 6. Continued.

Panel B: Local airlines					
CRSP date code	Mean	Standard deviation	Quartiles		
			75%	50%	25%
3764	-0.00322	0.00391	-0.00172	-0.00299	-0.00430
3803	-0.00020	0.00419	0.00155	0.00059	-0.00083
3822	-0.00069	0.00725	0.00323	0.00137	-0.00860
3907	-0.00060	0.01146	0.00113	-0.00336	-0.00789
3926	0.00166	0.00692	0.00595	0.00345	-0.00304
3957	-0.00277	0.00557	0.00315	-0.00469	-0.00706
3979	-0.00071	0.00782	0.00347	-0.00111	-0.00269
4028	-0.00445	0.00970	0.00343	-0.00553	-0.01276
4060	-0.01249	0.01033	-0.00441	-0.01299	-0.02052
4082	-0.00378	0.02325	0.00443	-0.00513	-0.02183

Appendix 7.

Panel A: Coefficients of merger and acquisition events			
CRSP date code	Firm	Coefficient	p-value
3139	American	-0.00722	0.3872
	PanAm	0.00115	0.9281
	Eastern	0.00820	0.4206
3265	American	-0.00362	0.6619
	PanAm	0.02776	0.0293
	Eastern	-0.00233	0.8175
4016	Continental	-0.00207	0.8314
	Western	0.00391	0.6461
4052	Continental	-0.01122	0.2527
	Western	-0.02154	0.0119
4122	Eastern	-0.01083	0.2843
	National	0.02477	0.0115
4046	National	0.01809	0.0623
	PanAm	0.00981	0.4410
4056	National	0.01711	0.1820
	PanAm	0.01489	0.3762
3064	PanAm	0.02235	0.0833
	TWA	0.02732	0.0062
3073	PanAm	0.00556	0.6627
	TWA	0.01446	0.1436
3724	Alaska	0.01451	0.2585
3776	Alaska	-0.00546	0.6777
3496	Saturn	0.04658	0.0001
3609	Saturn	0.00838	0.6647
Panel B: Coefficients of strike events			
3055	Braniff	-0.00620	0.4167
3089	Braniff	0.00157	0.8400
3584	Continental	0.00516	0.5932
3600	Continental	-0.01262	0.1924
3007	National	-0.01729	0.0737
3076	National	0.00945	0.3269
3293	National	-0.01802	0.0613
3379	National	0.00632	0.5154
3274	Northwest	0.00070	0.9162
3371	Northwest	0.00317	0.6420
3965	Northwest	-0.00519	0.4373
4040	Northwest	-0.00160	0.8108
3361	United	-0.00683	0.3254
3371	United	0.01249	0.0778