

Negotiating with Labor under Financial Distress*

Efraim Benmelech
Harvard University and NBER

Nittai K. Bergman
MIT Sloan and NBER

Ricardo Enriquez
Harvard University

* We thank Richard Freeman, Luigi Guiso, Larry Katz, Andrei Shleifer, Jeremy Stein and seminar participants at Harvard University, University of Melbourne, and University of New South Wales for useful comments. All errors are our own.

Efraim Benmelech, Department of Economics, Harvard University, Littauer Center, Cambridge, MA 02138. E-mail: effi.benmelech@harvard.edu. Nittai Bergman, Sloan School of Management, MIT, 50 Memorial Drive, Cambridge, MA 02142. E-mail: nbergman@mit.edu. Ricardo Enriquez, Department of Economics, Harvard University, Littauer Center, Cambridge, MA 02138. E-mail: enriquez@fas.harvard.edu.

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Abstract

We analyze how firms renegotiate labor contracts by strategically using pension underfunding to extract concessions from labor. While anecdotal evidence suggests that firms tend to renegotiate down wages in times of financial distress, there is no empirical evidence that documents such renegotiation and its determinants. This paper attempts to fill this gap. Using a unique data set of airlines that includes detailed information on wages, employees and pension plans we document an empirical link between airline financial distress, pension underfunding and wage concessions. We show that airlines in financial distress obtain wage concessions from employees whose pension plans are underfunded. We exploit, as part of our identification strategy, the fact that pension plans in the U.S are partially insured by the Pension Benefit Guaranty Corporation (PBGC). While most defined benefits pensions in the U.S. are insured by the PBGC, this coverage is limited. The maximum annual guarantee is determined by the employee age and was \$30,978 for a 60 year-old worker in 2006. We show that since highly-paid employees with promised pensions that exceed the PBGC limit stand to lose more if their pension is dumped they make large wage concessions. Our empirical evidence highlights the strategic use of pension underfunding by firms and the wage cuts that employees take as a result.

I. Introduction

We analyze how firms renegotiate labor contracts by strategically using pension underfunding to extract concessions from labor. While anecdotal evidence suggests that firms tend to renegotiate down wages in times of financial distress, there is no empirical evidence that documents such renegotiation and its determinants. This paper attempts to fill this gap. Using a unique data set of airlines that includes detailed information on wages, benefits and pension plans we document an empirical link between airline financial distress, pension underfunding and wage concessions.

Previous research on the interaction between financial decisions and labor has documented that unionized firms maintain low levels of cash and high leverage. However, less is known on the ability of firms to renegotiate labor contracts and in particular the role that finance plays in such negotiations. We focus on the threat of ‘pension dumping’; by which firms threaten to strip employees of their defined benefits pension by dumping underfunded pension plans and renegeing on the promise of retirement payments. Our paper is closely related to Ippolito (1985) who argued that firms may deliberately underfund their pension plan despite a tax disadvantage in order to deter their labor unions from holding-up the firms by potentially imposing capital losses on workers covered by the pensions. We provide *direct* evidence on the actual mechanism in which airlines use underfunded pensions and the threat to dump those pensions in order to extract labor concessions in and out of bankruptcy.

We first show that airlines in financial distress obtain wage concession from employees whose pension plans are underfunded. Since employees with underfunded pension plans bear a higher cost when firms default, their outside option in the event of default is reduced. Therefore, in bargaining, management can employ the threat of ‘pension dumping’ to extract greater concessions from labor. We then exploit, as part of our identification strategy, the fact pension plans in the U.S are partially insured by the Pension Benefit Guaranty Corporation (PBGC) – a federal corporation which protects the pensions of nearly 44 million American workers. While most defined benefits pensions in the U.S. are insured by the PBGC, this coverage is limited. The maximum annual guarantee is determined by the employee age and was \$30,978 for a 60 year-old worker in 2006. We conjecture that since highly-paid employees with promised pensions that exceed the PBGC limit stand to lose more if their pension is dumped they will be more likely to make concessions during labor bargaining.

Our identification strategy thus relies on a triple-difference or DDD specification, with three levels of differences: (i) financially distressed vs. non-distressed airlines, (ii) underfunded pension plans vs. funded plans, and (iii) wages exceeding vs. those that are below the PBGC limit. We find that airlines that are financially constrained can negotiate down the wages of their employees whose pensions are underfunded and are not fully covered by the PBGC guarantee. Our results are robust to the inclusion of year, airline, plan and airline-by-year fixed effects in addition to airline and employee controls.

We find that the DDD estimator is negative and statistically significant and ranges from -9.3% to -11.2%, implying that airlines that are financially constrained can negotiate down the wages of their highly-paid employees whose pensions are not fully covered by the PBGC maximum guarantee. In particular, the DDD estimator is -9.2% and -11.4% when the pension plan is underfunded by at least 10%, and 15%, respectively. In terms of levels (in \$ thousands) instead of the percentage change, financially constrained airlines with underfunded pension plans extract from employees with an average wage that exceeds the PBGC limit an amount that is between \$12,252 and \$17,360 per employee.

One concern with the identification strategy is that the DDD estimator is just picking-up those employee groups that account for a larger share of the airline wage expenses and hence have larger margins to make concessions. To address this concern, we control throughout the paper and in every regression we run for the ratio between the wage of an employee group and overall wage expenses. Our results are always robust to the inclusion of the wage share variable and are not likely to be driven by relative wage shares.

We further address the concern about specific employee groups driving our results for reasons that are unrelated to their pension status and PBGC coverage with a placebo test. Using data on airlines that do not have defined benefits pensions plans we define within-airline placebo ‘pension plan’ similar to those of airlines with defined-benefits pensions based on employee groups (pilots, mechanic etc.) We next run regressions separately for airlines with deeply underfunded plans (the treatment group) and airlines with no defined-benefits plans (placebo). These regressions confirm that our results are not driven by some employee groups who made wage concessions across the industry for reasons that are unrelated to pension underfunding. We find that within an employee group only those who are employed by airlines with defined benefits plans that are also underfunded take wage cuts, while wages are unchanged for similar employees working in airlines that do not

have defined-benefits pensions.

Earlier research on the intersection between corporate finance and labor economics has documented that unionization rates are correlated with leverage at the industry level (Bronars and Deere (1991)). Similarly, using firm-level data, Hirsch (1991), Cavanaugh and Garen (1997) find evidence that leverage is positively correlated with unionization rates, and Klasa, Maxwell, and Ortiz-Molina (2008) show that firms in more unionized industries hold less cash. However, while making important empirical contributions, the results reported in these papers may be driven by an omitted variables bias in which industries with higher unionization rates also have higher debt capacity for different reasons. This concern has been alleviated recently by Matsa (2009) who shows using exogenous variation in state-level labor laws that once states adopt legislation that reduces union bargaining power, firms with concentrated labor markets reduce debt relative to otherwise similar firms in other states. While all the empirical evidence hinges on the notion that firms set their financial position *ex-ante* in order to be in a better bargaining position *ex-post*, there is no empirical evidence for the role that financial distress plays in ex-post wage renegotiations. Our paper adds to this literature by documenting *actual* renegotiations ex-post, identifying the conditions under which firms can successfully use their financial position to extract surplus from labor. In particular, our paper is the first to provide micro-evidence on within-firm wage renegotiations and their relation to financial distress and pension underfunding.

The rest of the paper is organized as follows. Section ?? analyzes a simple contract-renegotiation model based on Hart and Moore (1994). Our model generates three intuitive predictions which are then tested in the data. Section ?? provides a case study analyzing the wage renegotiation in Delta Airlines between 2003 and 2006, and the role that the threat of ‘pension dumping’ played in the negotiations between management and Delta’s pilots. Section ?? provides a description of our data sources and summary statistics. We detail our identification strategy in Section ?. Sections ? and ? describe the empirical analysis. Section ? concludes.

II. The Model

This section develops a simple model analyzing labor contract renegotiation between a firm’s management and its employees in the spirit of Hart and Moore (1994). Our goal is to analyze the conditions under which management can successfully renegotiate labor contracts with workers and

the payoffs obtained by parties in any successful renegotiation. The relative sizes of pension liabilities, pension funding, and pension guarantees will play a key role in the renegotiation outcome, as these are key in determining the value of labor’s outside option in negotiation. The model provides three intuitive predictions: First, in order for management to successfully extract any concessions from labor, the firm’s financial position must be sufficiently poor. Second, conditional on management extracting concessions from workers, greater pension underfunding reduces workers post-renegotiation payoff, but, third, the sensitivity of worker payoffs to underfunding is reduced when government pension guarantees are larger.

A. Setup

Consider a firm that is run by management representing shareholders and that employs labor to generate earnings. The model is comprised of two periods. In the first period the firm is assumed to have free cash flow of C_1 – representing cash owned by the firm net of all payments, including wages, already made by the firm. In period 2, the firm will generate cash flow of C_2 . To approximate the situation faced by large publicly traded firms in the U.S., all cash flows are assumed to be non-expropriable.

Prior to period 1, workers and management are assumed to have signed a contract stipulating that, conditional on continued employment at the firm at period-2, workers will obtain a wage of W . As our focus is on contract renegotiation, the model does not analyze the ex-ante choice of W (i.e. prior to period 1) but rather takes it as exogenous.¹ For simplicity, we assume that $C_2 > W$, so that the firm always has enough funds to pay its wage obligation in period 2.

In addition to their promised wage, workers are owed an amount P in defined pension benefits in period 2. In period 1, the pension plan is funded by the firm to an amount F , where F can be either larger or smaller than P . In the latter case, the pension plan is underfunded. To capture in a simple manner the fact the firms are required to make mandatory contributions to pensions plans, we assume that if labor’s pension plan is underfunded in period 1, then in period 2, after having paid W in wages, the firm must use remaining cash balances to fully fund the pension.²

¹The wage, W can be thought of as committed to ex-ante, prior to period 1, when realizations of C_1 and C_2 are still uncertain. Then, at period 1, uncertainty is resolved, and parties decide whether to renegotiate the contract based on the analysis presented herein. For a similar analysis pertaining to financial contract renegotiation, see Benmelech and Bergman (2008b).

²Firms are required to make contributions to their defined benefit pension plans by the Employee Retirement Income Security Act of 1974.

The level of funding at period 2 is then equal to $\min[C_1 + C_2 - W + F, P]$.

To model the PBGC, we assume that the government guarantees labor's pension up to an amount G . Thus, in the event that the pension plan is underfunded and labor does not obtain its full pension benefits of P , the government will fund the pension plan up to G . We assume that the pension plan is first funded by the firm's available cash and only then funded by the government guarantee.³ For ease of exposition, we further assume that $G \leq P$ and that $G \leq C_1 + C_2 + F$. The former assumption implies that the pension guarantee does not cover the full amount owed to labor in pension benefits, while the latter implies that the pension guarantee is not larger than the firm value (gross of promised wages). Disposing these assumptions does not change our results at all but increases the number of cases that need to be dealt with.

Our model captures the essence of the insurance provided by the PBGC. According to the Employee Retirement Income Security Act of 1974, if a firm seeks to terminate an underfunded plan it must present the PBGC evidence for financial distress.⁴ If PBGC agrees that a firm is in distress, it makes an assessment of the size of the funding deficiency. If the plan's assets are large enough to cover all of the PBGC-guaranteed benefits but not to cover all benefit liabilities, then PBGC mandates the plan administrator to proceed to distribute the plan's assets in the specific order described in the law. After the distribution is done, the involvement of the PBGC in the termination is over. If the plan's assets are not enough to cover all of the PBGC-guaranteed benefits, then the PBGC takes over the plan as a trustee, transferring to itself all of the plan assets and records of the plan. From this point on, the investment and administration of the funds is done by the PBGC as the plan's trustee, and it has the obligation to transfer each plan beneficiary the guaranteed portion of her pension for life.⁵

The timing of events in the model is quite simple. At period 1 management decides whether to abide by its presigned labor contract or trigger renegotiation with labor. If management abides by the contract and does not trigger renegotiation, the firm reaches period 2 and generates C_2 in cash flow. It then pays out wages W , and funds the pension plan as described above. To the extent that

³This follows the mandate of the Employee Retirement Income Security Act of 1974.

⁴There are three criteria in which a distressed termination may be accepted by the PBGC: 1) liquidation in bankruptcy or insolvency proceedings; 2) reorganization in bankruptcy or insolvency proceedings; and, 3) the termination is required to enable the payment of debts while staying in business or to avoid unreasonably burdensome pension costs caused by a declining workforce.

⁵Even when a plan is trustee by the PBGC, there are workers that have accrued pension benefits that are smaller than the PBGC guaranty. These workers receive the smaller amount from the PBGC. The beneficiaries that actually get the maximum guaranty are those that had accrued benefits larger or equal than what the PBGC guarantees.

the pension plan is not fully repaid, the PBGC provides its pension guarantee up to an amount G as described above. Any remaining cash balances are then dispersed to shareholders.

If management does decides to trigger contract renegotiation, the outcome is based on Nash bargaining, with management assumed to have bargaining power μ . As in Hart and Moore (1994), we assume that management has human capital which is crucial for the ongoing success of the project. In order to extract concessions from labor, management can therefore threaten to withdraw this human capital, liquidate the firm, and dump the pension plan.⁶ Thus, in attempting to renegotiate the labor contract, management is in essence threatening labor with the firm's demise, and with it, the inability of the firm to pay wages and pension benefits. Labor's (off-equilibrium path) outside option in bargaining will then be determined solely by the available free cash flow and pension funding at period 1 (C_1 and F , respectively) as well as by the size of the PBGC pension guarantee, G .⁷

B. Contract Renegotiation, Pension Underfunding, and Pension Guarantees

In this section we solve for the equilibrium of the game described above. To do so, we analyze under what conditions management decides to trigger renegotiation. Consider the following cases:

I. $P \leq C_1 + F$:

Under this scenario, pension underfunding ($P - F$) is smaller than the period-1 cash balances of the firm. Thus, even if the firm is liquidated, labor obtains its full promised commitment of P . Management then obtains the difference $C_1 + F - P$. While these two values represent the respective outside options of the two parties, the surplus from continuing to period 2 is C_2 . Thus, conditional on management triggering renegotiation, labor obtains $P + (1 - \mu)C_2$. Since management needs to pay labor $P + W$ if it abides by the contract, it will prefer to trigger renegotiation when $(1 - \mu)C_2 < W$. Thus, if C_2 is sufficiently high, management prefers to abide by the contract since labor obtains a relatively high fraction of the continuation rents. Importantly, in this region (i.e.

⁶Alternatively, one can assume that negotiation takes the form of an alternating offer bargaining game, where during negotiation, firms continuation prospects continuously decline. The Nash bargaining outcome then corresponds to the subgame perfect equilibrium of the alternating offer game. Thus, when the payoffs to initiating the alternating offer game are higher than those of abiding by the contract, triggering negotiation is indeed a credible threat of management. For an analysis along these lines see Benmelech and Bergman (2008b).

⁷As an alternate assumption one can assume that the firm can threaten labor that it will dump the pension plan, but that in doing so, the firm need not necessarily be liquidated. However, with such an assumption there must be an exogenous cost of pension dumping, since otherwise pension dumping would always be optimal. This exogenous cost could stem from a loss of firm reputation and an increased need in monitoring by workers.

when $P < C_1 + F$) the payoff to labor is independent of changes in the degree of pension funding, F . If management abides by the contract, labor is paid in full, while if management renegotiates, pension funding is irrelevant since (1) labor's outside option is to obtain full payment on its pension and (2) the surplus, C_2 , is also independent of funding status. We thus have:

Lemma 1. *If $P \leq C_1 + F$, renegotiation occurs only when $(1 - \mu)C_2 < W$ and labor payoffs are independent of pension funding F .*

II. $C_1 + F < P$:

In this region, the period-1 assets of the firm are not sufficient to cover the firm's pension obligations. This has two implications. The first is that, in renegotiation, management's outside option is zero. The second is that since the pension plan is not fully funded, if the firm liquidates in period 1, the size of the pension guarantee may play a role in determining payoffs – it will affect both the surplus from continuing to period 2 as well as labor's outside option in renegotiation. To analyze these effects, we divide this region into two cases:

IIa. $G \leq C_1 + F < P$:

In this region, labor's outside option in renegotiation is to obtain $C_1 + F$, all in the form of pension benefits. Since the pension guarantee G is too low compared to the funds available for pension repayment, it does not provide any benefit to workers, and hence plays no role in determining payoffs. Since the surplus from continuation is C_2 , labor will obtain $C_1 + F + (1 - \mu)C_2$ in renegotiation. Management triggers renegotiation therefore when $C_1 + F + (1 - \mu)C_2 < P + W$. Thus, since in this region $C_1 + F < P$, renegotiation will occur when the firm's future prospects, C_2 , are sufficiently low compared to the precontracted wage obligation, W . Indeed a sufficient condition for renegotiation is $(1 - \mu)C_2 < W$. If renegotiation does occur, labor's payoff decreases one-for-one with reductions in pension funding, F : In this region, period-1 assets do not cover pension liabilities and the pension guarantee is too low to be relevant. Thus, reductions in pension funding, F , are directly translated into reductions in labor's outside option, $C_1 + F$, and hence also into labor payoffs.

Lemma 2. *If $G \leq C_1 + F < P$, renegotiation occurs when $(1 - \mu)C_2 < W$. If renegotiation occurs, labor payoffs decrease one-for-one with reductions in pension funding, F .*

IIb. $C_1 + F < G < P$ and $G \leq C_1 + C_2 + F$:

In this region, the pension guarantee G is comparatively high relative to the available period-1 assets of the firm. Because of this, labor's outside option in renegotiation is to obtain a payoff of G : The firm's period-1 assets do not cover its pension liabilities, implying that the PBGC funds the difference between G and $C_1 + F$. Further, because of the government guarantee, and in contrast to prior cases, the surplus from continuation to period-2 is now $C_1 + C_2 + F - G$. Thus, if management triggers renegotiation, labor obtains $G + (1 - \mu)(C_1 + C_2 + F - G)$. Management will decide to trigger renegotiation when $G + (1 - \mu)(C_1 + C_2 + F - G) < P + W$. As in prior cases, a sufficient condition for renegotiation to occur is $(1 - \mu)C_2 < W$ - i.e. that the firm's prospects are sufficiently poor compared to its obligations to labor.

If renegotiation does occur, reductions in pension funding reduce labor's payoff, but *less* than one-for-one. Indeed, as can easily be seen, a dollar reduction in funding reduces labor's ultimate payoff by only $1 - \mu$. This is due to the effect of the pension guarantee. Since the guarantee is sufficiently large, labor's outside option in renegotiation is fixed at G and protected from declines in pension funding, F . Still, a decline in F reduces the surplus from continuation to period 2, and labor bears a fraction $(1 - \mu)$ of this reduction. We thus have:

Lemma 3. *If $C_1 + F < G < P$ and $G \leq C_1 + C_2 + F$, renegotiation occurs when $(1 - \mu)C_2 < W$. If renegotiation occurs, labor payoffs decrease by $(1 - \mu)$ for every unit reduction in pension funding, F .*

Combining Lemmas 1 through 3 provides the following three predictions:

Prediction 1. *All else equal, the ability of management to extract concessions from labor in contract renegotiation is decreasing in the strength of a firm's financial position as proxied by firm current and future cash flows as well as its level of pension funding.*

Prediction 2. *If a firm's financial position is sufficiently poor to extract concessions from labor in renegotiation, increases in pension underfunding will reduce labor payoffs.*

Prediction 3. *The sensitivity of post-renegotiation labor payoffs to pension underfunding will be greatest amongst pension plans where the PBGC guarantee is relatively small compared to the pension obligations.*

III. Labor Negotiations and Pension Dumping in Delta Airlines: A Case Study

In this section, we briefly describe the negotiations between Delta Air Lines and the approximately 9,000 pilots represented by the Air Line Pilots Association (ALPA) that took place from 2003 until late 2006. We argue that Delta's ability to obtain substantial wage concessions from its pilots (and from its workers in general) was largely due to their highly underfunded defined benefit pension. This, together with the fact that the PBGC pension guarantee would cover a relatively small fraction of the underfunding, implied that pension termination meant billions of dollars in potential losses for pilots.⁸

A. The Prolonged First Negotiation

In July, 2001, Delta and ALPA's pilots signed a 5-years contract which would make Delta's pilots the highest paid in the industry and which included annual wage increases of 4.5%.⁹ However, as a result of the downturn in the industry following the September 11th attacks, Delta asked ALPA in April 2003 for a 22% cut in pilots' hourly wages and the cancellation of the 4.5% annual raises due on May 2003 and 2004. Delta executives argued that this cut was necessary for the airline to remain competitive, especially since its two largest competitors, American Airlines and United Airlines, recently obtained considerable wage concessions from their labor unions.

What followed was a series of offers and counteroffers between Delta's management and the pilots union. Delta's initial bargaining position was not ideal. On the one hand, employee pension plans were underfunded by approximately \$4.9 billion, implying that pension termination would be quite costly for labor. On the other hand, Delta's balance sheet was much stronger than that of American Airlines and United, making it more difficult to extract concessions from labor.¹⁰ As negotiations drew on, however, the condition of the airline industry, and Delta in particular, continued to deteriorate, enhancing the firms bargaining position.

By December 2003, ALPA was offering a 9% pay cut plus the cancellation of the 4.5% increase due on May 2004. Management rejected this offer and by June 2004 was demanding a 30% reduction

⁸This description relies on information obtained from articles in the Wall Street Journal, the Atlanta Journal-Constitution, the New York Times, the Associated Press, the Financial Times and the Dow Jones Business News.

⁹Three years later, in 2004, Delta pilots' average wage was \$209,330 while Northwest pilots – the second highest paid in the industry – earned on average \$169,208. Average wages of pilots in Continental, US Airways, United and American Airlines were \$145,060, \$132,715, \$131,930 and \$129,947, respectively.

¹⁰See The Wall Street Journal, July 23, 2003, "Delta Pilots Contract Talks Break Down."

in pilot compensation. The pilot union countered with an offer to cut wages by 23%. By the end of July, with Deltas condition continuing to deteriorate, management answered with an increased pay cut demand of 35%, amounting to \$1.02 billion a year in pilot concessions. Finally, In November 10, 2004, Deltas management and ALPA arrived at a deal involving a 32.5% wage cut, changes to work rules that would increase pilots' flying time, a switch to a cheaper retirement plan for younger pilots, and the freezing of the pilots' pension plan. In return, pilots received options on Delta stock as well as other profit sharing arrangements. Panel A of Table ?? displays detailed information on wages and pension plan funding status for the years 2004, 2005, and 2006. Moreover, Panel B of Table ?? shows the outcome of the renegotiations. Consistent with our model, the pilots whose average wages were much higher than the PBGC maximum guaranty made wage concessions of 32.5%. In contrast, non-pilots workers that were mostly covered by the PBGC guaranty agreed to a much smaller 10% wage cut.

B. The Second Negotiation

Four weeks after the \$1 billion agreement, Delta's management returned to the bargaining table arguing that to avoid bankruptcy the pilots would need to agree to further concessions. The threat of bankruptcy was particularly acute to labor, as at the time, the airline's defined benefit pension plans were underfunded by approximately \$3.3 billion (Table ??).

In the ensuing months, Delta unsuccessfully sought additional concessions from its pilots, and as a result, filed for Chapter 11 on September 14, 2005. Upon filing, Delta presented its unionized pilots with a new compensation plan calling for further annual concessions of approximately \$325 million which included a 20% pay cut. Further, in October of the same year, Delta received permission from the bankruptcy court to halt pension payments to retirees.

By this time, Delta's pilots were highly concerned that the carrier would opt to terminate their defined benefit plan. Such termination would be quite costly for pilots – by the end of the year, Deltas estimated that its pension plans were underfunded by \$4.6 billion. Further, because of pilots comparatively high wage and retirement benefits, the PBGC benefit guarantee would provide them with little coverage in the event of termination. As a result of what appeared to be a credible threat of plan termination, the pilot union agreed to re-open negotiations with Delta. One of the central issues in the talks was to be the future of the pilot pension plan.¹¹

¹¹Indeed, during one of the hearings in bankruptcy court, an ALPA attorney said to his Delta counterpart that

In March 2006, Delta asked its pilots for additional concessions worth \$305 million a year for four years, including a 18% pay cut. ALPA’s counteroffer included concessions amounting to \$140 million a year and a demand for a \$1 billion note from Delta payable in case the pilot pension plan was terminated. For the first time during negotiations, Delta’s executives told the pilots that it was likely that the firm would terminate their pension plan. Finally, in June 2006, Delta’s pilots ratified a 3.5 year agreement on concessions that included cost savings of \$280 million a year with a 14% wage cut. Additionally, the new contract paved the way for Delta to seek termination of the pilots’ pension plan. In return, Delta promised the union a \$650 million payment and a \$2.1 billion claim convertible into a yet-to-be-determined stake in the reorganized Delta. The agreement would reduce average pilot pay from \$151,000 to just under \$130,000 a year.

C. The Pilots Plan Termination

On September 1st, 2006, Delta requested that the bankruptcy judge allow the firm to terminate the pilots’ pension plan and to transfer its liabilities to the PBGC. The judge approved the termination request on September 6th, and thereby allowed Delta to avoid approximately \$3 billion in payments needed to bring the plan to full funding. Delta transferred \$1.7 billion in assets to the PBGC to cover more than \$4.7 billion in benefit liabilities. PBGC estimated that out of the \$3 billion in underfunded pension liabilities it would be liable for \$920 million, implying a loss of more than \$2 billion for the ALPA pilots. As Panel B of Table ?? shows, the pilots’ pension plans were more underfunded – arguably strategically – than those of the non-pilots workers. As a result the pilots made an additional concession of 14.0% compared to only 7.5% by non-pilots workers.

IV. Data and Summary Statistics

This section describes the construction of our data set and displays summary statistics for the main variables in our analysis.

A. Sample Construction

We use two main data sources to construct our sample: (1) the Bureau of Transportation Statistics (BTS) data on individual airlines, and (ii) data on airlines’ pension plans from the Department of Labor’s form 5500. We also supplement these data with information from Compustat and SDC.

”we’ll go out in the halland get a deal if the airline would gaurantee it would not terminate the pilot’s pension plan.”
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A.1 Calculating Average Wages

Using the Air Carrier Financial Reports (Form 41 Financial Data) from the BTS, we obtain financial information as well as detailed data on airline employees and their compensation for large U.S. certified air carriers. In particular, we obtain data on the number of employees, and their wages by job type. We also obtain industry data from the BTS on average aircraft fuel cost for airlines and industry profitability.

We use Schedule P-6 from the BTS's Form 41 to obtain detailed information on wages for different job categories in airlines. Schedule P-6 provides operating expenses for air carriers with annual operating revenues of at least \$20 million. The different job categories for which wage information is available are: (1) General Management Personnel; (2) Flight Personnel; (3) Mechanics & Maintenance; (4) Aircraft and Traffic Handling Personnel; and, (5) Other Personnel. We use the BTS's Schedule P-52 to calculate aggregate pilot wages, and then subtract this amount from the aggregate Flight Personnel's wages obtained from Schedule P-6.¹² We thus divide the Flight Personnel group into two separate sub groups – Flight Attendants and Pilots. This process, therefore, yields six separate job categories which are used in our data analysis: (1) Pilots; (2) Flight Attendants; (3) Mechanics & Maintenance; (4) Aircraft and Traffic Handling Personnel; (5) General Management Personnel; and, (6) Other Personnel.

Next, we use the Air Carrier Employees database from BTS to calculate the number of employees in each job category for every airline. In particular, we use the Annual Employee Statistics by Labor Category (Schedule P-10 from BTS's Form 41) which includes detailed data on the number of employees per job category for the years 1990 to 2007. There are 15 different categories that group together employees with closely related jobs. We use the BTS Employment Categories Descriptions to match each of the 15 employee categories to one of the six job categories described above.¹³

For each of these 6 job categories we divide total wages of the group by the number of employees in that group to obtain the average wage per employee in each job category. As a result, we have information on wages per employee for the airline as a whole and for each of the following job groups: (1) Pilots; (2) Flight Attendants; (3) Mechanics & Maintenance; (4) Aircraft and Traffic Handling Personnel; (5) General Management Personnel; and, (6) Other Personnel. Finally, we

¹²Schedule P-52 contains operating expenses for each aircraft type for every carrier. By adding across aircraft types for every airline, we construct an aggregated figure for Pilots' wages.

¹³See Appendix A for detailed description of job groups and categories.

calculate the annual percent change in wages per employee, as well as the dollar change for each group.

A.2 Airline Financial Data

We continue by collecting earnings data from BTS Form 41's Schedule P-12. We define profitability as income before discontinued operations and extraordinary items plus depreciation and amortization divided by total assets. Using balance sheet data from BTS Form 41's Schedule B-1, we calculate leverage as total current liabilities plus long-term debt divided by total assets. Finally, using Compustat data we construct yearly airline market-to-book ratios.¹⁴

A.3 Pension Plans Data

We obtain available data on all defined benefit pension plans covering employees of US airlines. Firms with defined-benefits pension plans are required to file Form 5500 with the IRS for each plan. Using all filings of Form 5500 in the years 1992 to 2006, we identify all defined benefit plans that have 100 or more active participants in the airline industry, and that are sponsored by a single employer.¹⁵ We calculate the level of plan underfunding by subtracting the total assets the plan has from the current liability of the total benefits due to all plan participants.¹⁶ We define a dummy variable for plan underfunding, which takes on a value of one if a plan is underfunded, and zero otherwise. As we are also interested in analyzing the effect of deep underfunding. We define underfunding dummies for underfunding levels larger than 10%, 15% and 25% of plan assets. Appendix A provides further details on the construction of these variables.

We continue by matching each defined benefit pension plan to one of the six BTS job categories (some plans are matched to more than one category as described below). This matching is then used to relate pension plan information, such as pension underfunding, to our main dependent variable, the average wage per employee in each job category. In most cases, the match is straightforward since the pension plan includes the job title in its name (Pilots, Flight Attendants, Mechanics, etc). A second category is one in which some pension plans are linked to a specific labor union. In these cases, we analyze which of the airline's job categories (out of the six BTS categories) are associated

¹⁴We cannot construct market-to-book for airline-year observations in which airlines are not publicly traded firms.

¹⁵This last filter is important since in multi-employer plans it is not clear which firm actually carries out the labor negotiations. Nevertheless, the vast majority of airlines' defined benefit pension plans are single-employer plans.

¹⁶While other measures of underfunding exist, we use the common definition of underfunding used by the PBGC.

with this specific union and calculate our dependent variables accordingly.¹⁷ A third set of pension plans are specifically for non-unionized workers. For these cases we calculate the average wage per employee using all job groups that do not have a separate pension plan linked to a union. A fourth group of plans are “aggregate plans” in the sense that they cover all of the firm’s workers without craft distinction.¹⁸ In these cases, we use as dependent variable the average wage per employee for the firm as a whole. Finally, some airlines have only two plans: one for pilots and the other for all other employees. A fifth set of pension plans, therefore, are specifically for non-pilots. In these cases we calculate the relevant average wage per employee associated with the plan by aggregating all non-pilot job categories together.

Matching the BTS and the Form 5500 data and restricting our sample to plans that have at least two observations, we end up with 559 plan-year observations corresponding to 14 different airlines.¹⁹ Out of the 559 plan-year observations, 482 plan-year observations representing 12 airlines have market-to-book data.²⁰ We winsorize our dependent variable at the 0.5th and 99.5th percentiles (0.5% per tail) and also exclude observations with a Market-to-Book or Leverage value that is more than four standard deviations away from its corresponding mean. Six observations are dropped, leading to a final sample size of 476 plan-year observations.

B. Data Characteristics and Summary Statistics

Panel A of Table ?? provides summary statistics on wages of airline employees. The average airline in our sample has 45,663 employees (median 39,952) and wages account on average for 24.1% (median 24.9%) of operating revenues for the airlines in our sample. There is a large dispersion in average wages across different employees groups. While the average wage across all employees is \$70,143 a year, the average wages of pilots is \$125,203, while flight attendants and mechanics earn on average \$34,210, and \$58,731, respectively. We also calculate wage shares for each of the

¹⁷For example, if a union includes both flight attendants and mechanics within an airline, the average wage is calculated as the sum of wages given to flight attendants and to mechanics divided by the number of employees in the flight attendants and mechanics employee groups. We then calculate the annual percent change in wages per employee for this “enlarged” group within the airline.

¹⁸Some firms have an aggregate plan on top of their craft plans, while other have only aggregate plans for their workers (as is the case with United Parcel Services and Federal Express).

¹⁹There are three small airlines (Astar Air Cargo, Markair Inc. and ABX Air) for which the available data allows us only to build a single observation per plan. They are excluded from the sample as most of our empirical specifications include either firm or plan fixed effects.

²⁰The 12 airlines in our sample for which we have market-to-book data are: Alaska Airlines, American Airlines, Continental Airlines, Delta Airlines, Federal Express, Hawaiian Airlines, Midwest Airlines, Northwest Airlines, Trans World Airlines, United Airlines, United Parcel Services and US Airways. Aloha Airlines and Shuttle Inc are dropped as they do not have market-to-book data.

employee groups which we define as the ratio of wages of an employee group to the overall wage expenses of the airline. Panel A of Table ?? also provides summary statistics on the percent annual change in average wages for each employee group which we use as our dependent variables in the regressions analyses. As Panel A shows, the average annual increase in wages per employee in our sample across all employee types is 3.8% (median 3.8%). The standard deviation of 12.6%, points to the high variability in annual wage adjustments for most job groups.

Panel B of Table 2 provides summary statistics for the explanatory variables used in our regressions. Starting with the underfunding dummy variables, Panel B demonstrates that on average 55.7% of the plan-year observations show some level of underfunding, while 38.9%, 34.0% and 22.1% of the plans are underfunded by at least 10%, 15% and 25% of the plan's total assets, respectively. The mean size (total assets) of an airline in our sample is \$10.8 billion, and the average market-to-book ratio, leverage ratio and profitability are 1.25, 0.56 and 3.67%, respectively.²¹ About 15.5% of our plan-year observations are linked to an airline in Chapter-11. As a measure of financial difficulties we define a low cash flow dummy that equals one for airlines in which cash flow from operations (income before extraordinary items + depreciation and amortization) plus cash balances are less than their interest expense, and 0 otherwise.²² The average earnings plus cash balances are \$336.0 million and the average interest expense is \$231.8 million. This low cash flow dummy takes a value of one for 29.6% of the observations.²³

Another important variable in our analysis is the maximal annual pension guarantee provided by the Pension Benefit Guaranty Corporation (PBGC). As described in greater detail in the next section, the PBGC is a [federal institution??] which provides monthly payments to retirees of terminated pension plans that were underfunded at the time of termination. This payment, however, is capped, at an amount that varies by employee age. Indeed, as can be seen in Panel B of Table 2, 43.5% of the observations have an average wage per employee that is larger than 1.5 times the maximum annual guaranteed payment offered by the PBGC for that year, and 33.8% earn more than twice the PBGC maximum guarantee.²⁴

²¹Note that these averages are based on plan-year observations and hence the data is weighted by plan-year observations per airline.

²²See Asquith, Gertner and Scharfstein (1994), and Benmelech and Bergman (2008) for similar approaches.

²³Our analysis is robust to other definitions of low cash flow or low profitability.

²⁴The benchmark annual guaranty used on this calculation is for a worker that retires at age 65. Table A1 provides detailed information on the PBGC maximum guaranty.

V. Empirical Strategy

The wage structure of the airline industry and in particular the clear disparity in pay levels across job categories, combined with the financial difficulties and frequent bankruptcy filings of air carriers make the airline industry a natural setting to test the relation between financial distress and labor negotiations. Furthermore, the fact that most of the legacy carriers in the U.S. are highly unionized and have traditionally offered defined-benefits pension to their employees enables us to study the strategic use of underfunded defined benefits pension plans in wage renegotiation.

As shown in the model in Section 2, an airline is more likely to obtain concessions from labor when its financial condition is sufficiently poor, as only then does it have the required credibility to renegotiate labor contracts. Further, conditional on renegotiation occurring, the model shows that employee concessions will be larger when the underfunding of their pension plan is greater. In these cases employees' outside option is lower. Finally, the model predicts that the effect of underfunding on wage concessions will be larger amongst plans where the PBGC pension coverage is lower. Based on these predictions, our identification strategy can be divided into two.

We first show that airlines are more likely to obtain wage concessions when (1) the airline is financially constrained (measured by either having low cash flow or being in bankruptcy) and (2) when the pension plan is underfunded. To do so we interact the financial position of an airline with the funding status of the relevant pension plan to determine whether, in firms in financial distress, employees that are exposed to the risk of losing their pension benefits are more willing to make concessions. This approach focuses the analysis at the pension plan level while using variation in firm financial distress and pension plan underfunding. In employing this approach we control for either firm or plan fixed effects to identify off of within airline or within plan variation. We thus exploit both the cross-sectional dispersion at the plan level as well as the time-series variation in their underfunding status.

Clearly, both an airline's financial position and pension plan underfunding are endogenous and likely to be jointly driven by such factors as airline profitability. However, by using an interaction term we can limit the number of alternative explanations that may drive our results. For example, an airline level financial shock cannot solely explain differential wage concessions across different employee groups, while our mechanism is based on different levels of underfunding of their corresponding pension plans.

The second layer of our identification strategy exploits the maximum pension guaranty which is set exogenously by the Pension Benefit Guaranty Corporation (PBGC). The PBGC is responsible for paying monthly benefits to retirees of underfunded terminated pension plans. However, the PBGC guarantee is limited. The maximum annual guarantee is a function of age and hence is identical for employees of the same age regardless of their education, skill or wage. Table A1 reports the maximum annual amounts covered by the PBGC for workers retiring in the years 1992 to 2006 at the age of 50, 55, 60 and 65 years. As can be seen, the maximum amount guaranteed is determined by age and has increases over time. Throughout our sample, the average maximum guaranty for a retiring 60-year-old worker is \$24,224 while that for a 65-year-old is \$37,268.

Figure 1 displays average wages for different employee groups relative to the PBGC maximum at different retirement ages. Given that the PBGC limit is set by law exogenously, we use the difference between current wages of different airline's employee groups and the PBGC maximum limit to measure the amount these employees stand to lose if the pension plan will be terminated. Clearly, when this difference is larger, employees stand to lose from pension plan termination making their bargaining position in wage renegotiation weaker. We exploit the high dispersion between average wages and the PBGC limit across different job categories within an airline to identify the bargaining power of the airlines vis-a-vis different employee groups. As an example, the average wage of a pilot in our sample is about five times the PBGC limit for a 60 years old retiree, and the average mechanic wage is more than twice the PBGC limit for the same age. In contrast, the average wages of flight attendants and traffic and handling workers are higher than the PBGC limit by only 40% and 60%, respectively. Our approach is consistent with Brown's (2008) assertion that "[t]he maximum insurance benefit is set by law. While more than 90 percent of participants in plans taken over by the PBGC fall below this benefit limit, in some prominent cases, including those of some airline pilots, worker lose a substantial fraction of their promised retirement income."²⁵

Econometrically, we identify the effect of pension underfunding on wage concessions using a triple-difference or DDD specification. These three levels of differences are: (i) financially distressed vs. non-distressed airlines, (ii) underfunded pension plans vs. funded plans, and (iii) wages exceeding vs. those that are below the PBGC limit. This approach is common in applied microeconomics (see for example Gruber (1994)), and has become more popular recently in corporate finance applications as well as in Rauh (2006).

²⁵Brown (2008) p. 184.

VI. Wages, Financial Distress, and Underfunded Pensions

This section presents the results from regression analysis of wage renegotiation. We begin by testing the relation between firm financial distress, underfunded defined benefits pension plans and wage negotiations by estimating different variants of the following baseline specification:

$$\begin{aligned} \% \Delta(wages/employees)_{a,i,t} &= \beta_1 \times low\ cash\ flow_{a,i,t} + \beta_2 \times underfunding_{a,i,t} \\ &+ \beta_{12} \times (low\ cash\ flow_{a,i,t} \times underfunding_{a,i,t}) \\ &+ \mathbf{b}_a \gamma + \mathbf{c}_i \delta + \mathbf{d}_t \theta + \mathbf{X}_{\mathbf{a},\mathbf{t}} \lambda + \epsilon_{a,i,t}, \end{aligned} \quad (1)$$

where $\% \Delta(wages/employees)$ is the annual percent change in the average wage of an employee group within an airline for that year. Subscripts indicate airline (a), employee group (i), and year (t); *low cash flow* is a dummy variable that equals one if an airline’s earnings plus cash balance is smaller than its interest expenses and zero otherwise;²⁶ *underfunding* is a dummy variable that equals one for underfunded pension plans; \mathbf{b}_a is a vector of airline fixed-effects; \mathbf{c}_i is a vector of employee group fixed-effects; \mathbf{d}_t is a vector of year fixed-effects; $\mathbf{X}_{\mathbf{a},\mathbf{t}}$ is a vector of airline controls that includes size (log book value of assets), leverage, the market-to-book ratio and the wages share of the employee category group as a fraction of total wage expenses; and $\epsilon_{a,i,t}$ is the regression residual.

We report the results from estimating different variants of regression ?? in the first three columns of Table ?. Tables throughout the paper report regressions coefficients and standard errors that are clustered at the airline level. Our main coefficient of interest is β_{12} – the coefficient of the interaction term which captures the joint effect of financial distress at the airline level and the underfunding of the specific pension plan of an employee group within the airline on wage concessions made by members of that employee group.

As the first three columns of Table ?? demonstrate, we find that β_{12} is consistently negative and statistically significant – distressed airlines obtain wage concessions from the employee groups whose pension plans are underfunded.²⁷ Our results hold after controlling for airline specific controls, year fixed effects and both airline and plan fixed effects.²⁸ The estimates of β_{12} are between -3.7% and

²⁶Our results are not sensitive to this definition, we obtain similar results if we define low cash flow as airlines with non-positive earnings, or as those airlines with profitability rates below the 33rd percentile.

²⁷While the coefficients of both low cash flow and underfunding are negative they are not statistically different from zero.

²⁸Obviously we cannot control for both airline and plan fixed-effects at the same time as employee groups are defined at the airline level.

-4.7%, suggesting that airlines obtain wage concessions that are around 4% of the annual average wage when both cash flow is low and pension plan underfunded.

We repeat the analysis in regression (??), this time using bankruptcy as a measure of financial distress. To this end, we replace the *low cash flow* dummy variable with a bankruptcy dummy variable that takes on the value of one when an airline is in Chapter-11 during a given year.²⁹

The results for the bankruptcy regressions are reported in the last three columns of Table ??. While we find that average wages decline by between 6.9% and 9.8% during bankruptcy years, the interaction between bankruptcy and underfunding is not statistically significant in any of the three regressions presented in the table.

We augment the analysis of the bankruptcy regressions by splitting our data into two subsamples; before and after the events of September 2001. We do so since most of the bankruptcies in our data took place post 9/11 and may represent a different regime in which airlines might have found it easier to terminate defined benefits pension plans in Chapter-11 reorganizations. Table ?? presents the results from estimating regression ?? during the 1992-2001 and 2002-2006 separately. As the first three columns of the table show, and consistent with the results in Table ??, the coefficient on the bankruptcy dummy is significant both economically and statistically during the 1992-2001 period, implying that airlines obtain wage concessions that are between 11.9% and 24.3% of the previous year's average wage while in bankruptcy. However, during the 1992-2001 there is no evidence that airlines were able to strategically use the threat of pension plan termination to obtain concessions from their employees; the coefficient on the interaction term between the bankruptcy and underfunding dummies is either not statistically significant or positive and significant.

In contrast, the last three regressions presented in Table ?? show that in the 2002-2006 period, airlines were able to obtain wage concessions from their employees while in bankruptcy only if their defined benefits pension plans were underfunded. This is illustrated by the fact that while the coefficient of the bankruptcy dummy is positive and not statistically significant, while the interaction term is statistically significant and economically sizeable ranging between -12.3% and -17.1%.

²⁹None of the airlines in the sample filed for chapter-7. The Chapter-11 bankruptcies in our sample include: Continental Airlines (1990-1993), Trans World Airways (1992-1993 and 1995), Hawaiian Airlines (1993-1994 and 2003-2005), US Airways (2002-2003 and 2004-2005), United Airlines (2002-2006), Delta Airlines (2005-2007) and Northwest Airlines (2005-2007).

VII. Wages, Pension Underfunding and the PBGC Maximum Guarantee

The results thus far show that wages are more likely to be negotiated downwards during periods of financial distress when defined benefits plans are underfunded. While the evidence is consistent with a strategic use of pension underfunding, it is also possible that pension underfunding merely reflects deep financial distress. According to this alternative view, the specific mechanism is not the threat of pension-dumping but rather the overall poor financial position of the firm. Thus, while our results indicate that two conditions are needed to facilitate wage concessions – both financial distress and pension underfunding – it is also possible to argue that, empirically, the interaction term is capturing a severe version of financial distress and does not necessarily indicate a causal effect of the threat to dump pensions.

A. Differences-in-Differences-in-Differences: Financially Constrained Airlines

To identify the causal effect of pension underfunding, we exploit the variation in the difference between airline employee salaries and the PBGC maximum annual guarantee. The strategic use of pension underfunding in wage renegotiation predicts that the finding that financial distress and pension underfunding are associated with wage concessions should be concentrated amongst employee groups whose pensions are not fully covered by the PBGC guarantee. Indeed, since employees belonging to these groups would stand to lose the most from pension plan termination, their outside option in wage renegotiation is lower. To test this prediction, we use the following triple interaction specification:

$$\begin{aligned}
 \% \Delta(\text{wages/employees})_{a,i,t} &= \beta_1 \times \text{low cash flow}_{a,i,t} + \beta_2 \times \text{underfunding}_{a,i,t} + \beta_3 \times \text{PBGC}_{a,i,t} \\
 &+ \beta_{12} \times (\text{low cash flow}_{a,i,t} \times \text{underfunding}_{a,i,t}) \\
 &+ \beta_{13} \times (\text{low cash flow}_{a,i,t} \times \text{PBGC}_{a,i,t}) \\
 &+ \beta_{23} \times (\text{underfunding}_{a,i,t} \times \text{PBGC}_{a,i,t}) \\
 &+ \beta_{123} \times (\text{low cash flow}_{a,i,t} \times \text{underfunding}_{a,i,t} \times \text{PBGC}_{a,i,t}) \\
 &+ \mathbf{b}_a \gamma + \mathbf{c}_i \delta + \mathbf{d}_t \theta + \mathbf{X}_{\mathbf{a},t} \lambda + \epsilon_{a,i,t},
 \end{aligned} \tag{2}$$

where $\% \Delta(wages/employees)$ is the annual percent change in the average per-employee wage of one of the employee groups within an airline for that year. Subscripts indicate airline (a), employee group (i), and year (t); *low cash flow* is a dummy variable that equals one if airline’s earnings plus cash balance is smaller than its interest expenses and zero otherwise; *underfunding* is a dummy variable that equals one for underfunded pension plans and zero otherwise; PBGC is a dummy variable that equals to one if the average wage is larger than 1.5 times the PBGC annual maximum guarantee; \mathbf{b}_a is a vector of airline fixed-effects; \mathbf{c}_i is a vector of employee group fixed-effects; \mathbf{d}_t is a vector of year fixed-effects; $\mathbf{X}_{a,i,t}$ is a vector of airline controls that includes size (log book value of assets), leverage ratio, the market-to-book ratio and the wages share of the employee category group as a fraction of total wage expenses; and $\epsilon_{a,i,t}$ is the regression residual.

The main coefficient in the DDD specification is β_{123} which identifies the effect of underfunded pension plans, in financially distressed airlines, on the wages of employees that are not fully covered by the PBGC maximum guarantee.

As the first three columns of Table ?? show, the DDD estimator β_{123} is negative and statistically significant, ranging from -9.3% to -11.2%. Thus, consistent with strategic wage renegotiation, airlines in financial distress can successfully negotiate down the wages of their employees whose pensions are underfunded and are not fully covered by the PBGC maximum guarantee. As before, our results are robust to the inclusion of year and either airline or plan fixed effects in addition to airline specific controls. In the last three columns of the table we refine the definition of the underfunding dummy to capture higher levels of underfunding. The DDD estimator is -9.2% when the pension plan is underfunded by at least 10%, while it is -11.4% and -7.6% when the pension plan is underfunded by at least 15% and 25%, respectively.³⁰

We supplement our analysis by regressing the change in average wages (instead of the percentage change) and report results in Panel A of Table A2. The DDD estimator β_{123} estimates the average amount (in \$ thousands) that financially constrained airlines extract from employees whose average wage exceeds the PBGC limit when their pension plans are underfunded. As the first three columns of the table show, airlines can strategically use underfunded pensions to reduce the average wage of relatively highly paid employees who are not covered by the PBGC by an amount that is between \$12,252 and \$14,795 per year. Furthermore, as the fifth and six columns of Table ?? show, an underfunding level of at least 15% or 25% allows airlines to cut the average wage of highly-paid

³⁰We cannot reject a statistically significant difference between either of the three estimates.

employees by an annual amount of \$16,983 and \$17,360, respectively.

While the results thus far indicate that airlines with low cash flow can successfully negotiate down the wages of highly paid employees when their pensions are underfunded, it is possible that the effect is driven mostly by bankrupt airlines that operate under Chapter-11 protection (see Table ??). To address this question, we study the ability of airlines to extract wage concessions outside of bankruptcy by estimating regression ?? while excluding airlines in Chapter-11 from the analysis.³¹ This results in a sample size of 402 plan-year observations representing the same 12 airlines and 45 plans.³² The results are reported in Table ??.

The estimates of β_{123} in the first three columns of Table ?? are between -10.0% and -12.3% and are similar to the estimates in Table ?. Airlines appear, therefore, able to utilize pension underfunding not covered by the PBGC to negotiate down wages even outside of bankruptcy. In fact, as we have documented earlier in Delta's case study, employees may be willing to make wage concessions in order to *avoid* a Chapter-11 filing by the airline. While the DDD estimate is negative in two out of the three the last three columns, where we examine the effect of deep pension underfunding (at the 10%, 15%, and 25% level), it lacks statistical significance. This may be because most of the plans that are highly underfunded are those of bankrupt airlines which are excluded from the analysis in Table ?. As before, we also provide estimates (in \$ thousands) of actual wage concessions obtained by non-bankrupt financially distressed airlines in Panel B of Table A2. We find that average annual wages are reduced by between \$8,663 and \$10,924 outside of bankruptcy when the threat to terminate a pension plan is credible.

A.1 Robustness tests

Our empirical strategy is to study within firm wage renegotiation by using intra-airline data on wages, pension underfunding, and relative PBGC coverage. While our results are robust to the inclusion of both airline and year fixed effects, it is still possible that the variation in our regressions comes from changes in the degree of airline financial distress over time as opposed to pure within-airline cross-sectional variation in pension funding. We attempt to alleviate this concern by including airline*year fixed-effects in the regressions. Results are report in Table ?. The inclusion airline*year fixed effects allows us to have a cleaner within-airline comparison of different

³¹See Benmelech and Bergman (2009) for a similar approach.

³²We loose a plan for a group of pilots for US Airways as we only have complete data for this plan from 2003 to 2005, years in which US Airways was in Chapter-11.

employee groups. As the table shows, the DDD coefficient is negative and is similar to our previous results (-0.092 in Table ?? compared to -0.102 in Table ??). Given our the sample size (476 plan-year observations), the inclusion of 137 fixed effects diminishes the statistical significance of the results. Nevertheless, in our main specification $\beta_{123}=-0.092$ and is statistically significant at the 5 percent level. When we consider underfunding of at least 10% we find that $\beta_{123}=-0.081$ and is not statistically significant (standard error=0.054), when underfunding if defined at the 15% level $\beta_{123}=-0.098$ and is significant at the 6 percent level. Finally, we do not find significant results when deep-underfunding is calculated at an underfunding level of 25%.

One concern with the identification strategy is that the DDD estimator is just picking-up those employee groups that account for a large share of an airline’s wage expense and hence have larger margins to make concessions. For example, according to this alternate hypothesis, firms in financial distress can negotiate highly paid pilots’ wages downwards not because of the fact that their pensions are not covered by the PBGC but simply because pilots have larger slack in which to make wage concessions.³³

This concern is taken into account//alleviated[[[???]]] in two ways. First, throughout the paper in every regression we control for the ratio between the wage of an employee group and the overall wage expense of the firm. For example, we divide the aggregate wages of pilots and co-pilots by the total wage expenses of the airline. We find that the results are always robust to the inclusion of this wage share variable. Second, it should be noted that the alternate hypothesis that highly paid employees have larger concession margins in renegotiation does not easily explain the impact of pension plan *underfunding* on the ability of firms to extract wage concessions. In particular, if the results are explained by greater slack among highly paid employee groups rather than by strategic use of pensions in bargaining, pension plan underfunding should not play much of a role. This reasoning suggests the following placebo analysis to test the importance of underfunded pension plans in strategic renegotiation.

We collect data on airlines that do not have defined benefits pensions plans – mostly small regional airlines, with the exception of Southwest and JetBlue.³⁴ For each of these airlines, we define within-airline placebo ‘pension plan’ similar to those of airlines with defined-benefits pensions,

³³Note, though, that this theory implicitly requires that the level of pilots’ rents (as defined by the difference between pilot wages and their next best outside offer) be higher than that of other employee groups, as opposed to simply their wage level being higher than that of other groups.

³⁴The minimum size of an airline in the BTS data is \$20 million.

i.e. based on employee groups (pilots, mechanic etc.) We next run a set of double interaction regressions with the annual change in employee-group wages as the dependent variable. As the independent variables the regressions include the low cash flow dummy variable, the PBGC-based dummy variable (that takes on a value of one if the average annual wage of a given employee group is larger than 1.5 times the PBGC annual maximum guarantee, and the interaction between these two variables. As further controls the regressions include year and either airline or plan fixed effects, as well as leverage, wage share, and both airline size and size-squared to adjust for a potential non-linear effect of airline size given that many of the airlines without defined benefits pension plans are small.³⁵ We run the regressions separately for airlines with pension plans deeply underfunded at levels greater than 10% or 15% (the treatment group) and airlines with no defined-benefits plans (placebo). As table ?? shows, the coefficient of the interactions between the low cash flow dummy variable and the PBGC dummies are negative (between -0.062 and -0.102) and statistically significant in the specifications that include both airline and year fixed effects. In contrast, when we run the regression using the placebo group, the coefficient of the interaction term is positive and close to zero (either 0.02 or 0.028) and is not statistically significant. Had our results been driven by some employee groups making concessions for reasons that are unrelated to pension underfunding – for example, highly paid pilots having greater slack to make concessions – the interaction term should have been negative and significant in the placebo regressions as well.

As an additional robustness test we control for industry conditions in Table ?? and reestimate regression ?. We construct three aggregate measures of airline industry condition: (i) weighted-average market-to-book, (ii) average fuel cost, and (iii) industry average profitability. Appendix A provides details on the construction of these variables. Since our measures of industry performance are based on pure time-series variation, we cannot include both year fixed-effects and industry controls jointly. As Table ?? demonstrates, the inclusion of industry controls (in lieu of year effects) improves the precision of the DDD estimates, which are now always statistically significant at the 1 percent level. The point estimates are similar to those documented earlier – underfunded pension plans enable distressed airlines to extract wage concessions that are between 9.7% and 11.4% of the annual average wage.

Finally, while we do not control for unionization levels directly, labor unions are important determinants of wage increases and collective bargaining negotiations (Lewis (1986)). However, our

³⁵We cannot control for market-to-book given that the vast majority of the smaller airlines are not publicly traded.

focus on one particular industry alleviates the concern about the differential effect of unionization on wage negotiations within our sample for two main reasons. First, air transportation is among the most unionized industries – according to Hirsch and Macpherson’s estimates 45.1% of the employees in the air transportation employees were unionized in 2008 – while many of the studies in this field utilize cross-industry variation in unionization levels. Second, by studying airlines with defined benefits pension plans we focus on highly unionized airlines within the airline industry.³⁶ Thus, our results are unlikely to be driven by omitted unionization levels.

While firm-level measures of unionization are not widely available, cross-sections of firms for the years 1977 and 1987 were derived from surveys of manufacturing firms (Hirsch (1991)). An additional cross-section for 1999 has been compiled by Eschuk (2001) from company 10-K which was recently used in Matsa (2009). We follow Eschuk (2001) and read the 10-Ks of every airline in our sample.³⁷ Some airlines report the actual number of their employees that are unionized while other airlines just mention whether a large share of their employees are unionized or not. We report the direct share of the employees that are unionized whenever the information is available in the airline’s 10-K. Otherwise, we use a dummy variable equals to 1 if the airline reports that a large number of its employees are unionized. As Table ?? demonstrates, most of the airlines in our sample – with the exception of Delta airlines and Fedex – are highly unionized. Furthermore, the level of unionization is very persistent and stays almost constant over time and hence by controlling for airline or plan fixed-effects we are fully absorbing any differential effect of unionization.

B. Differences-in-Differences-in-Differences: Airlines in Chapter-11

We now turn to analyze the effect of Chapter-11 on wage negotiations using the DDD approach. We repeat the analysis in regression (??) but replace the Low Cash Flow dummy variable (meant to capture poor financial condition) with a bankruptcy dummy variable, taking the value of one when an airline is in bankruptcy. Similar to our previous analysis, we estimate different specifications of

³⁶For example, JetBlue, the prominent example of non-unionized airline has no defined benefits pension plan and hence is not included in our sample.

³⁷Airline 10-Ks are available in Edgar online starting at 1995.

the following baseline regression:

$$\begin{aligned}
\% \Delta(\text{wages/employees})_{a,i,t} &= \beta_1 \times \text{bankruptcy}_{a,i,t} + \beta_2 \times \text{underfunding}_{a,i,t} + \beta_3 \times \text{PBGC}_{a,i,t} \\
&+ \beta_{12} \times (\text{bankruptcy}_{a,i,t} \times \text{underfunding}_{a,i,t}) \\
&+ \beta_{13} \times (\text{bankruptcy}_{a,i,t} \times \text{PBGC}_{a,i,t}) \\
&+ \beta_{23} \times (\text{underfunding}_{a,i,t} \times \text{PBGC}_{a,i,t}) \\
&+ \beta_{123} \times (\text{bankruptcy}_{a,i,t} \times \text{underfunding}_{a,i,t} \times \text{PBGC}_{a,i,t}) \\
&+ \mathbf{b}_a \gamma + \mathbf{c}_i \delta + \mathbf{d}_t \theta + \mathbf{X}_{\mathbf{a},\mathbf{t}} \lambda + \epsilon_{a,i,t},
\end{aligned} \tag{3}$$

As before, we are interested in the DDD coefficient β_{123} which measures the joint effect of bankruptcy and underfunding on the wages of employees that are not fully covered by the PBGC maximum guarantee. We report the results from estimating regression ?? in Table ?. We find that β_{123} is negative and between -9.5% and -16.4% in all specifications. When we control for both year and airline fixed effects the DDD coefficient is -12.8% and is statistically significant at the 5 percent level. Further, we find that high levels of underfunding lead to deeper wage concessions in bankruptcy; underfunding of at least 15% of the plan level is associated with average wages that are 16.4% lower. Likewise, underfunding of at least 25% leads to a 14.8% decline in annual average wage. As before, we also use the actual change in average wages (in \$ thousands) instead of the percentage change as a dependent variable and report the results in Panel C of Table A2. The average amount (in \$ thousands) that bankrupt airlines extract from employees whose average wage exceeds the PBGC limit when their pension plans are underfunded is between \$12,778 and \$22,621 per year. As in Table ?, the DDD estimates imply large dollar amounts of concessions per employee.

Finally and as in Table ?, we include three measures of industry conditions in lieu of year fixed effects in regression ?? and report the results in Table ?. Our results are robust to the inclusion of industry variables with airline fixed-effects, and β_{123} ranges between -11.7% and -13.0%.

VIII. Conclusion

In this paper we analyze both theoretically and empirically airlines' renegotiations of labor contracts. We provide a simple model showing that airlines' ability to strategically renegotiate wages decreases in the airline's financial position and increases in the amount of underfunding of its pension obligations. Furthermore, the sensitivity of post-renegotiation labor payoffs to pension underfund-

ing is greatest amongst pension plans where the PBGC guarantee is relatively small compared to the pension obligations. Our empirical results indicate that, consistent with the model, airlines in poor financial position are able to renegotiate and reduce labor costs of those employees whose pension plans are underfunded. Furthermore, exploiting the exogenously given PBGC maximum guarantee we show that airlines extract larger concessions from employees with average salaries higher than the PBGC limit. Our evidence supports the view that firms use their financial position to negotiate with labor and use the threat of ‘pension dumping’ strategically to extract concessions from unionized labor.

Appendix A: Variable description and construction

For reference, the following is a list of the variables used in the paper and their sources. A brief description of how they were constructed is included.

1. *Assets (Size)*: The firm's Total assets [BTS Schedule B-1 data item 18990] in \$million. (Source: Bureau of Transportation Statistics, Form 41 Financial Data).
2. *Bankruptcy dummy*: Takes a value of 1 if the firm is bankrupt during a particular year, and 0 otherwise.
3. *Earnings*: The firm's income before discontinued operations and extraordinary items [BTS Schedule P-12 data item 91990] + depreciation and amortization [BTS Schedule P-12 data item 70000]. (Source: Bureau of Transportation Statistics, Form 41 Financial Data).
4. *High wage dummy ($Wage > 1.5 * PBGC$)*: Takes a value of 1 if the wage per employee of the particular job group being analyzed is larger than 1.5 times the maximum PBGC guaranty for that particular year, and 0 otherwise.
5. *Industry average fuel cost (industry control)*: The average total fuel cost per gallon for the entire airlines industry in a year, denominated in \$dollars. (Source: Bureau of Transportation Statistics, Airline Fuel Cost and Consumption - U.S. Carriers - Scheduled).
6. *Industry market-to-book (industry control)*: Weighted average (by firm's assets) of the market-to-book ratios for the 12 firms for which we have available information. (Source: Compustat).
7. *Industry profitability (industry control)*: Average profitability of the airline industry, defined as the aggregate earnings of all airlines [BTS Schedule B-1 data item 18990] over total aggregate assets of all airlines [BTS Schedule B-1 data item 18990]. (Source: Bureau of Transportation Statistics, Form 41 Financial Data).
8. *Job groups or categories*: The BTS Form 41 Schedule P-10 groups workers in 15 different categories, while the wage information we have gathered classifies them into six categories. The BTS's employment categories descriptions are used to match the 15 employee categories with the six wage categories. This grouping is as follows: 1) Pilots (Pilots & Co-pilots + Other

- Flight Personnel); 2) Flight Attendants (Passenger/General Services & Administration); 3) Mechanics & Maintenance (Maintenance); 4) Traffic and Handling (Aircraft & Traffic Handling Group 1 + General Aircraft & Traffic Handling + Aircraft Control + Passenger Handling + Cargo Handling); 5) General Management (General Manager); and, 6) Other (Trainees & Instructor + Statistical + Traffic Solicitors + Other + Transport Related).
9. *Leverage*: The firm's total current liabilities [BTS Schedule B-1 data item 21990] + long-term debt [BTS Schedule B-1 data item 22100] all over total assets [BTS Schedule B-1 data item 18990]. (Source: Bureau of Transportation Statistics, Form 41 Financial Data).
 10. *Low cash flow dummy*: Takes a value of one if the firm's earnings + cash balances [BTS Schedule B-1 data item 10100] are smaller than its interest expenses (which are defined as the interest on long-term debt and capital leases [BTS Schedule P-12 data item 81810] + other interests [BTS Schedule P-12 data item 81820]), and zero otherwise.
 11. *Market-to-book*: The firm's market value of equity [Compustat Annual Items 24*25] + book value of assets [Compustat Annual Item 6] minus the book value of equity [Compustat Annual Item 60] all over book value of assets [Compustat Annual Item 6]. (Source: Compustat).
 12. *Maximum guaranty (by PBGC)*: The maximum yearly amount the Pension Benefit Guaranty Corporation insures in case of a defined benefit pension plan termination. This amount depends both on the age of the worker at the time of retirement and on the calendar year in which the worker retires. If a worker's vested pension benefits are lower than the PBGC maximum guaranty, the worker receives no more than the maximum guarantee upon pension plan termination. (Source: Pension Benefit Guaranty Corporation).
 13. *Profitability*: Earnings over total assets [BTS Schedule B-1 data item 18990]. (Source: Bureau of Transportation Statistics, Form 41 Financial Data).
 14. *Relative (%) change in wages per employee*: The wages per employee at time (t) - wages per employee at time (t-1) all over wages per employee at time (t-1).
 15. *Underfunding*: The current liability of total benefits (for all participants) [IRS Form 5500 Schedule B] - (plan) total assets [IRS Form 5500 Schedule H]. Note that this is positive when there is plan underfunding and negative when there is overfunding. For years 1992 to 1994

the OBRA87 current liability is used, while for 1995 to 2006 the RPA94 current liability is employed. (IRS Form 5500).

16. *Underfunding Dummies*: Take on a value of one if underfunding is larger than a certain percentage of plan total assets, and zero otherwise. The benchmark is underfunding larger than zero, but different thresholds are used to analyze deep underfunding. In particular, we use dummies for underfunding > 10% of plan total assets, underfunding > 15% of plan total assets and for underfunding > 25% of plan total assets.
17. *Wages per employee*: The total amount of wages given to an employee group in a year over the total number of employees in that group that year. The variable used in the regressions refers to the wages per employee of the particular job category (or categories) that matches the employee group covered by a certain defined benefit pension plan. A detailed description of how this variable is constructed is offered in the Sample Construction section. (Source: Bureau of Transportation Statistics, Form 41 Financial Data).
18. *Wage share*: The ratio of the wage of an employee group to the overall wage expenses of the airline.

Appendix B: Appendix Tables

Table A1
Maximum Annual Guarantees Given by PBGC

This table provides the maximum annual amount covered by the Pension Benefit Guaranty Corporation gives at different ages at the time of retiring.

	50 Years	55 Years	60 Years	65 Years
1992	\$9,879	\$12,702	\$18,348	\$28,227
1993	\$10,238	\$13,163	\$19,013	\$29,250
1994	\$10,739	\$13,807	\$19,943	\$30,682
1995	\$10,810	\$13,899	\$20,076	\$30,886
1996	\$11,097	\$14,267	\$20,608	\$31,705
1997	\$11,598	\$14,911	\$21,539	\$33,136
1998	\$12,099	\$15,556	\$22,469	\$34,568
1999	\$12,815	\$16,476	\$23,769	\$36,614
2000	\$13,531	\$17,397	\$25,128	\$38,659
2001	\$14,247	\$18,317	\$26,458	\$40,705
2002	\$15,034	\$19,330	\$27,921	\$42,955
2003	\$15,392	\$19,790	\$28,585	\$43,977
2004	\$15,535	\$19,974	\$28,851	\$44,386
2005	\$15,965	\$20,526	\$29,649	\$45,614
2006	\$16,681	\$21,447	\$30,978	\$47,659
Mean	\$13,044	\$16,771	\$24,224	\$37,268

Table A2
Actual Wage Concessions (\$ Change)

The dependent variable in all regressions is the dollar change in (Wages/Employees) in '000s. All regressions include an intercept (not reported). Standard errors are calculated by clustering at the airline level.

Panel A: Wages Underfunding and PBGC Coverage (\$ Change)								
	undefunding>							
			10%		15%		25%	
Dependent Variable=	\$ change in wages/employees	\$ change in wages/employees	\$ change in wages/employees	\$ change in wages/employees	\$ change in wages/employees	\$ change in wages/employees	\$ change in wages/employees	
Low Cash Flow × Underfunding × (Wage>PBGC)	-\$12,252 a (\$2,874)	-\$12,975 a (\$2,847)	-\$14,795 a (\$3,100)	-\$13,039 a (\$3,872)	-\$16,983 b (\$6,143)	-\$17,360 b (\$7,078)		
Adjusted R^2	0.14	0.16	0.19	0.18	0.20	0.21		
# of airlines	12	12	12	12	12	12		
# of plans	46	46	46	46	46	46		
Observations	476	476	476	476	476	476		
Panel B: Wages Underfunding and PBGC Coverage - Excluding Airlines in Chapter-11 (\$ Change)								
	undefunding>							
			10%		15%		25%	
Dependent Variable=	\$ change in wages/employees	\$ change in wages/employees	\$ change in wages/employees	\$ change in wages/employees	\$ change in wages/employees	\$ change in wages/employees	\$ change in wages/employees	
Low Cash Flow × Underfunding × (Wage>PBGC)	-\$8,663 b (\$2,954)	-\$8,947 c (\$3,267)	-\$10,924 c (\$5,300)	-\$6,839 (\$5,566)	-\$6,193 (\$4,394)	-\$286 (\$3,580)		
Adjusted R^2	0.13	0.13	0.18	0.17	0.17	0.17		
# of airlines	12	12	12	12	12	12		
# of plans	45	45	45	45	45	45		
Observations	402	402	402	402	402	402		
Panel C: Wages, Underfunding, Bankruptcy and PBGC Coverage (\$ Change)								
	undefunding>							
			10%		15%		25%	
Dependent Variable=	\$ change in wages/employees	\$ change in wages/employees	\$ change in wages/employees	\$ change in wages/employees	\$ change in wages/employees	\$ change in wages/employees	\$ change in wages/employees	
Bankruptcy × Underfunding × (Wage>PBGC)	-\$12,778 a (\$7,395)	-\$14,372 a (\$7,073)	-\$13,549 a (\$7,707)	-\$13,028 a (\$7,246)	-\$22,621 b (\$11,461)	-\$22,552 b (\$13,011)		
Adjusted R^2	0.19	0.20	0.21	0.21	0.24	0.24		
# of airlines	12	12	12	12	12	12		
# of plans	46	46	46	46	46	46		
Observations	470	470	470	470	470	470		
Fixed-Effects								
Year	Yes	Yes	Yes	Yes	Yes	Yes		
Airline	No	Yes	No	No	No	No		
Plan	No	No	Yes	Yes	Yes	Yes		

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Table 1:
**The Delta Airlines Case Study: Initial Situation and Negotiation Outcomes
for Pilots and for Non-Pilots**

This table provides descriptive statistics on wages and pensions of Pilots and Non-Pilots before and after the firms Bankruptcy (September 15, 2005). *Before Bankruptcy*: negotiations during 2003, 2004 and 2005 before bankruptcy. *After Bankruptcy*: negotiations during 2005 after bankruptcy and on 2006.

Panel A: Wage and Pension Plan Situation						
	Pilots			Non-Pilots		
	2004	2005	2006	2004	2005	2006
Number of employees	6,786	6,181	5,706	50,772	46,050	39,856
Wages						
- Total Wages (\$m)	\$1,421	\$961	\$726	\$2,525	\$2,040	\$1,705
- Average Wage (\$)	\$209,330	\$155,532	\$127,268	\$49,735	\$44,297	\$42,778
- PBGC Maximum Guaranty (\$)	\$44,386	\$45,614	\$47,659	\$44,386	\$45,614	\$47,659
- Wages share of job group	36.0%	32.0%	29.9%	64.0%	68.0%	70.1%
Plan underfunding						
- Underfunding (\$m)	\$1,194	\$1,858	\$2,172	\$2,124	\$2,728	\$2,965
- Underfunding per employee (\$)	\$175,957	\$300,530	\$380,687	\$41,834	\$59,239	\$74,393
- Underfunding as % of plan assets	40.8%	86.0%	124.6%	47.5%	59.2%	64.6%
- Funding ratio (Assets/Liabilities)	71.0%	53.8%	44.5%	67.8%	62.8%	60.8%
Panel B: Negotiation Outcomes						
	Pilots			Non-Pilots		
Before bankruptcy (Jan/03 - Sep/05)						
- Average wage cut	32.5%			10.0%		
- Pension plan status	Frozen			As usual (no change)		
After bankruptcy (Sep/05 - Dec/06)						
- Average wage cut	14.0%			7.5%		
- Pension plan status	Terminated			Frozen		

Table 2:
Summary Statistics

This table provides descriptive statistics for the variables used in the empirical analysis.

Panel A: Wage and Benefit Variables							
	Mean	25th Percentile	Median	75th Percentile	Standard Deviation	Min	Max
Total number of employees	45,663	9,523	39,952	72,480	35,446	1,856	126,634
(wages/operating revenue)	24.1%	21.2%	24.9%	27.5%	5.4%	11.6%	36.8%
Wage Share (of job group)	39.0%	18.3%	29.8%	47.0%	27.1%	1.9%	100.0%
(wages/employees)							
- Total	\$70,143	\$36,864	\$50,400	\$106,634	\$43,235	\$12,877	\$209,330
- Pilots	\$125,203	\$111,462	\$128,100	\$139,863	\$27,529	\$65,143	\$209,330
- Flight Attendants	\$34,210	\$29,834	\$34,184	\$38,049	\$6,629	\$19,519	\$49,576
- Mechanics and Maintenance	\$58,731	\$38,788	\$50,152	\$68,849	\$28,476	\$27,275	\$173,504
- Traffic and Handling	\$38,624	\$31,560	\$37,505	\$42,277	\$11,343	\$24,130	\$116,074
% change (wages/employees)							
- Total	3.8%	-2.2%	3.8%	8.8%	12.6%	-37.1%	67.3%
- Pilots	3.0%	-3.7%	3.4%	8.2%	11.3%	-37.1%	34.0%
- Flight Attendants	4.0%	-2.0%	2.5%	9.1%	13.0%	-30.7%	65.0%
- Mechanics and Maintenance	5.1%	-4.0%	3.3%	11.6%	18.8%	-53.6%	68.1%
- Traffic and Handling	1.3%	-4.8%	1.9%	6.7%	12.3%	-41.0%	59.0%

Panel B: Other Variables							
	Mean	25th Percentile	Median	75th Percentile	Standard Deviation	Min	Max
Underfunding dummy	0.557	0.0	1.0	1.0	0.497	0.0	1.0
Underfunding>10% of plan assets	0.389	0.0	0.0	1.0	0.488	0.0	1.0
Underfunding>15% of plan assets	0.340	0.0	0.0	1.0	0.474	0.0	1.0
Underfunding>20% of plan assets	0.271	0.0	0.0	1.0	0.445	0.0	1.0
Underfunding>25% of plan assets	0.221	0.0	0.0	0.0	0.415	0.0	1.0
Size (\$m)	\$10,792	\$4,189	\$8,725	\$17,815	\$7,979	\$160	\$28,177
Market-to-Book	1.252	1.020	1.136	1.251	0.479	0.743	4.084
Leverage	0.562	0.468	0.587	0.656	0.163	0.025	0.983
Profitability	3.67%	-0.61%	5.24%	9.53%	8.35%	-24.64%	26.14%
Low Cash Flow dummy	0.296	0.0	0.0	1.0	0.457	0.0	1.0
Bankruptcy dummy	0.155	0.0	0.0	0.0	0.363	0.0	1.0
(Wage>PBGC) dummy	0.815	1.0	1.0	1.0	0.389	0.0	1.0
(Wage>1.5*PBGC) dummy	0.435	0.0	0.0	1.0	0.496	0.0	1.0
(Wage>2*PBGC) dummy	0.338	0.0	0.0	1.0	0.474	0.0	1.0

**Table 3:
Wages and Underfunding**

The dependent variable in all regressions is the relative change in (Wages/Employees). All regressions include an intercept (not reported). Standard errors are calculated by clustering at the airline level.

Dependent Variable=	% change in wages/employees	% change in wages/employees	% change in wages/employees	% change in wages/employees	% change in wages/employees	% change in wages/employees
Ln(Assets)	-0.001 (0.004)	0.081 a (0.021)	0.070 a (0.022)	0.000 (0.004)	0.054 b (0.023)	0.050 b (0.022)
Leverage	0.031 (0.071)	0.209 b (0.085)	0.198 b (0.085)	0.085 (0.072)	0.104 (0.077)	0.106 (0.076)
Market-to-Book	0.006 (0.013)	-0.010 (0.027)	-0.019 (0.024)	0.022 (0.015)	0.039 (0.027)	0.030 (0.029)
Wage Share	-0.021 (0.017)	-0.028 (0.023)	1.428 a (0.357)	-0.029 c (0.014)	-0.038 c (0.020)	1.364 a (0.431)
Profitability				0.154 (0.110)	0.218 c (0.113)	0.188 (0.114)
Low Cash Flow	-0.014 (0.021)	-0.016 (0.023)	-0.020 (0.022)			
Underfunding	0.000 (0.010)	-0.009 (0.011)	-0.002 (0.017)	-0.006 (0.011)	-0.028 b (0.012)	-0.019 (0.016)
Low Cash Flow × Underfunding	-0.045 b (0.016)	-0.047 a (0.012)	-0.037 b (0.015)			
Bankruptcy				-0.069 a (0.019)	-0.098 b (0.032)	-0.097 b (0.036)
Bankruptcy × Underfunding				-0.036 (0.029)	0.004 (0.031)	0.016 (0.036)
Adjusted R^2 Fixed-Effects	0.08	0.11	0.12	0.13	0.14	0.14
Year	Yes	Yes	Yes	Yes	Yes	Yes
Airline	No	Yes	No	No	Yes	No
Plan	No	No	Yes	No	No	Yes
# of airlines	12	12	12	12	12	12
# of plans	46	46	46	46	46	46
Observations	476	476	476	470	470	470

Table 4:
Wages, Bankruptcy and Underfunding before and after 9/2001

The dependent variable in all regressions is the relative change in (Wages/Employees). All regressions include an intercept (not reported). Standard errors are calculated by clustering at the airline level.

	1992-2001	1992-2001	1992-2001	2002-2006	2002-2006	2002-2006
Dependent Variable=	% change in wages/employees	% change in wages/employees	% change in wages/employees	% change in wages/employees	% change in wages/employees	% change in wages/employees
Ln(Assets)	0.002 (0.006)	-0.032 (0.078)	-0.041 (0.079)	0.004 (0.009)	0.077 (0.095)	0.003 (0.115)
Leverage	0.158 (0.103)	0.126 (0.086)	0.143 (0.081)	-0.035 (0.080)	0.064 (0.199)	0.044 (0.216)
Market-to-Book	0.040 c (0.019)	0.049 (0.046)	0.077 (0.047)	0.024 (0.027)	0.045 (0.061)	-0.001 (0.085)
Wage Share	-0.035 b (0.012)	-0.029 c (0.014)	1.287 b (0.563)	-0.076 b (0.033)	-0.074 (0.074)	2.550 a (0.666)
Profitability	-0.042 (0.098)	-0.100 (0.144)	-0.152 (0.134)	0.387 a (0.111)	0.456 b (0.150)	0.445 b (0.184)
Underfunding	-0.017 (0.013)	-0.033 b (0.013)	-0.031 c (0.015)	0.062 c (0.032)	0.043 (0.038)	0.036 (0.050)
Bankruptcy	-0.123 a (0.019)	-0.208 a (0.020)	-0.221 a (0.022)	0.064 (0.038)	0.025 (0.059)	0.089 (0.067)
Bankruptcy × Underfunding	0.026 (0.024)	0.066 b (0.023)	0.111 a (0.019)	-0.171 a (0.035)	-0.123 b (0.046)	-0.163 c (0.073)
Adjusted R^2 Fixed-Effects	0.10	0.12	0.12	0.09	0.06	0.05
Year	Yes	Yes	Yes	Yes	Yes	Yes
Airline	No	Yes	No	No	Yes	No
Plan	No	No	Yes	No	No	Yes
# of airlines	12	12	12	11	11	11
# of plans	45	45	45	36	36	36
Observations	328	328	328	142	142	142

Table 5:
Wages Underfunding and PBGC Coverage

The dependent variable in all regressions is the relative change in (Wages/Employees). All regressions include an intercept (not reported). Standard errors are calculated by clustering at the airline level.

Dependent Variable=	% change in wages/ employees	% change in wages/ employees	% change in wages/ employees	undefunding>		
				10%	15%	25%
	% change in wages/ employees	% change in wages/ employees	% change in wages/ employees	% change in wages/ employees	% change in wages/ employees	% change in wages/ employees
Ln(Assets)	0.000 (0.005)	0.086 a (0.021)	0.061 b (0.024)	0.062 b (0.028)	0.064 b (0.029)	0.060 c (0.028)
Leverage	0.043 (0.076)	0.216 b (0.084)	0.200 b (0.082)	0.200 b (0.075)	0.202 b (0.072)	0.206 a (0.067)
Market-to-Book	0.004 (0.013)	-0.009 (0.027)	-0.014 (0.027)	-0.011 (0.024)	-0.008 (0.024)	-0.003 (0.023)
Wage Share	-0.008 (0.021)	-0.012 (0.028)	1.106 a (0.322)	1.152 a (0.322)	1.143 a (0.330)	1.169 a (0.341)
Low Cash Flow	-0.032 (0.026)	-0.035 (0.026)	-0.034 (0.022)	-0.034 (0.026)	-0.037 (0.030)	-0.019 (0.026)
Underfunding	-0.013 (0.018)	-0.028 (0.022)	-0.029 (0.024)	-0.006 (0.021)	-0.001 (0.026)	-0.017 (0.020)
Wage>PBGC	0.009 (0.017)	0.009 (0.012)	0.120 a (0.034)	0.129 a (0.039)	0.131 a (0.041)	0.137 a (0.042)
Low Cash Flow × Underfunding	-0.008 (0.021)	-0.003 (0.017)	0.010 (0.020)	0.012 (0.026)	0.018 (0.032)	-0.021 (0.026)
(Wage>PBGC) × Underfunding	0.036 (0.025)	0.049 (0.028)	0.042 (0.025)	0.029 (0.027)	0.025 (0.025)	0.026 (0.031)
Low Cash Flow × (Wage>PBGC)	0.052 (0.030)	0.053 (0.032)	0.056 c (0.031)	0.029 (0.034)	0.037 (0.034)	0.006 (0.040)
Low Cash Flow × Underfunding × (Wage>PBGC)	-0.093 b (0.030)	-0.102 a (0.025)	-0.112 a (0.024)	-0.092 c (0.048)	-0.114 b (0.041)	-0.076 b (0.034)
Adjusted R^2 Fixed-Effects	0.09	0.12	0.17	0.17	0.17	0.17
Year	Yes	Yes	Yes	Yes	Yes	Yes
Airline	No	Yes	No	No	No	No
Plan	No	No	Yes	Yes	Yes	Yes
# of airlines	12	12	12	12	12	12
# of plans	46	46	46	46	46	46
Observations	476	476	476	476	476	476

Table 6:
Wages Underfunding and PBGC Coverage - Excluding Airlines in Chapter-11

The dependent variable in all regressions is the relative change in (Wages/Employees). All regressions include an intercept (not reported). Standard errors are calculated by clustering at the airline level.

Dependent Variable=	undefunding>					
	% change in wages/employees	% change in wages/employees	% change in wages/employees	10% % change in wages/employees	15% % change in wages/employees	25% % change in wages/employees
Ln(Assets)	0.006 (0.006)	0.023 (0.041)	0.001 (0.041)	0.002 (0.041)	0.003 (0.044)	0.000 (0.041)
Leverage	0.169 c (0.093)	0.128 b (0.053)	0.141 b (0.055)	0.160 a (0.050)	0.147 b (0.050)	0.154 a (0.046)
Market-to-Book	0.040 c (0.023)	0.072 c (0.036)	0.052 (0.043)	0.054 (0.041)	0.049 (0.038)	0.043 (0.035)
Wage Share	-0.025 (0.026)	-0.027 (0.032)	0.904 c (0.460)	0.996 b (0.446)	0.979 c (0.448)	0.947 c (0.434)
Low Cash Flow	-0.037 (0.021)	-0.028 (0.022)	-0.029 (0.024)	-0.017 (0.030)	-0.025 (0.033)	-0.008 (0.030)
Underfunding	-0.027 (0.023)	-0.051 c (0.028)	-0.048 (0.031)	-0.035 (0.026)	-0.027 (0.033)	-0.035 (0.026)
Wage>PBGC	0.000 (0.016)	0.002 (0.015)	0.115 c (0.056)	0.126 c (0.060)	0.129 c (0.062)	0.138 b (0.061)
Low Cash Flow × Underfunding	0.028 (0.017)	0.027 (0.016)	0.035 (0.019)	0.018 (0.029)	0.039 (0.036)	-0.009 (0.037)
(Wage>PBGC) × Underfunding	0.049 (0.031)	0.065 (0.038)	0.058 (0.033)	0.039 (0.029)	0.037 (0.027)	0.029 (0.039)
Low Cash Flow × (Wage>PBGC)	0.073 c (0.034)	0.064 (0.038)	0.072 (0.051)	0.034 (0.049)	0.028 (0.045)	-0.006 (0.050)
Low Cash Flow × Underfunding × (Wage>PBGC)	-0.100 a (0.031)	-0.106 a (0.031)	-0.123 b (0.049)	-0.088 (0.074)	-0.079 (0.054)	0.010 (0.042)
Adjusted R^2 Fixed-Effects	0.05	0.07	0.12	0.11	0.11	0.11
Year	Yes	Yes	Yes	Yes	Yes	Yes
Airline	No	Yes	No	No	No	No
Plan	No	No	Yes	Yes	Yes	Yes
# of airlines	12	12	12	12	12	12
# of plans	45	45	45	45	45	45
Observations	402	402	402	402	402	402

Table 7:
Wages, Underfunding and PBGC Coverage
(controlling for airline-year fixed effects)

The dependent variable in all regressions is the relative change in (Wages/Employees). All regressions include an intercept (not reported). Standard errors are calculated by clustering at the airline level.

Dependent Variable=	% change in wages/employees	undefunding>		
		10%	15%	25%
	% change in wages/employees	% change in wages/employees	% change in wages/employees	% change in wages/employees
Ln(Assets)	-0.020 b (0.008)	-0.019 c (0.009)	-0.021 b (0.007)	-0.019 a (0.006)
Leverage	0.118 b (0.040)	0.124 b (0.041)	0.125 a (0.039)	0.131 a (0.026)
Market-to-Book	0.034 a (0.005)	0.033 a (0.003)	0.033 a (0.003)	0.032 a (0.003)
Wages Share	-0.008 (0.025)	0.000 (0.023)	0.002 (0.021)	0.003 (0.021)
Low Cash Flow	-0.079 a (0.024)	-0.073 c (0.037)	-0.080 b (0.034)	-0.091 b (0.031)
Underfunding	-0.045 (0.028)	-0.049 (0.033)	-0.038 (0.031)	-0.044 b (0.015)
Wage>PBGC	-0.002 (0.014)	0.013 (0.012)	0.018 (0.013)	0.020 (0.014)
Low Cash Flow ×Underfunding	0.035 (0.024)	0.041 (0.043)	0.058 (0.050)	0.057 (0.034)
(Wage>PBGC) ×Underfunding	0.052 (0.034)	0.038 (0.039)	0.030 (0.031)	0.036 (0.044)
Low Cash Flow ×(Wage>PBGC)	0.044 (0.031)	0.027 (0.030)	0.036 (0.035)	0.002 (0.036)
Low Cash Flow ×Underfunding ×(Wage>PBGC)	-0.092 b (0.039)	-0.081 (0.054)	-0.098 c (0.047)	-0.047 (0.057)
Adjusted R^2	0.22	0.22	0.22	0.21
Fixed-Effects				
Airline*Year	Yes	Yes	Yes	Yes
# of airlines	12	12	12	12
# of airline*year	137	137	137	137
# of plans	46	46	46	46
Observations	476	476	476	476

Table 8:
Cash Flow and High Wages: Placebo Test

The dependent variable in all regressions is the relative change in (Wages/Employees). All regressions include an intercept (not reported). Standard errors are calculated by clustering at the airline level.

Dependent Variable=	DB Firms Underfunding>10%		DB Firms Underfunding>15%		Non-DB Plan Firms	
	% change in wages/employees	% change in wages/employees	% change in wages/employees	% change in wages/employees	% change in wages/employees	% change in wages/employees
Ln(Assets)	-0.306 (0.378)	-0.542 (0.367)	-0.405 (0.364)	-0.366 (0.334)	-0.014 (0.055)	-0.012 (0.059)
Ln(Assets) Squared	0.024 (0.021)	0.039 c (0.021)	0.029 (0.021)	0.028 (0.020)	0.001 (0.005)	0.002 (0.006)
Leverage	0.175 (0.180)	0.101 (0.205)	0.219 (0.214)	0.179 (0.212)	0.024 (0.050)	0.032 (0.050)
Wage Share	-0.028 (0.053)	1.487 b (0.571)	-0.025 (0.063)	1.518 c (0.705)	0.152 b (0.065)	0.534 a (0.117)
Low Cash Flow	-0.040 (0.028)	-0.032 (0.041)	-0.029 (0.025)	-0.048 (0.038)	0.022 (0.046)	0.024 (0.049)
Wage>PBGC	0.082 a (0.021)	0.226 c (0.122)	0.095 a (0.024)	0.222 b (0.077)	0.194 a (0.049)	0.289 a (0.051)
Low Cash Flow ×(Wage>PBGC)	-0.071 c (0.033)	-0.079 (0.053)	-0.102 a (0.029)	-0.062 (0.047)	0.028 (0.073)	0.002 (0.076)
Adjusted R^2	0.03	0.11	0.06	0.12	0.08	0.07
Fixed-Effects						
Year	Yes	Yes	Yes	Yes	Yes	Yes
Airline	Yes	No	Yes	No	Yes	No
Plan	No	Yes	No	Yes	No	Yes
# of airlines	12	12	12	12	50	50
# of job groups	33	33	33	33	100	100
Observations	183	183	159	159	666	666

Table 9:
Wages Underfunding and PBGC Coverage (Including Industry Controls)

The dependent variable in all regressions is the relative change in (Wages/Employees). All regressions include an intercept (not reported). Standard errors are calculated by clustering at the airline level.

Dependent Variable=	M-to-B (12 Firms)		Industry Control Avg. Fuel Cost		Profitability	
	% change in wages/employees	% change in wages/employees	% change in wages/employees	% change in wages/employees	% change in wages/employees	% change in wages/employees
Ln(Assets)	0.038 (0.031)	0.025 (0.029)	0.023 (0.026)	0.011 (0.025)	-0.003 (0.024)	-0.012 (0.019)
Leverage	0.205 a (0.057)	0.200 a (0.048)	0.205 b (0.070)	0.199 a (0.060)	0.181 b (0.077)	0.173 b (0.066)
Market-to-Book	-0.029 (0.032)	-0.033 (0.025)	-0.038 (0.027)	-0.044 c (0.023)	-0.061 b (0.026)	-0.064 b (0.021)
Wage Share	-0.007 (0.027)	1.129 a (0.303)	-0.008 (0.027)	1.074 a (0.291)	-0.009 (0.024)	1.068 a (0.287)
Industry Control	-0.148 c (0.068)	-0.135 c (0.063)	-0.051 (0.030)	-0.043 (0.028)	0.104 (0.182)	0.009 (0.173)
Low Cash Flow	-0.045 b (0.018)	-0.042 b (0.017)	-0.029 (0.024)	-0.026 (0.021)	-0.026 (0.032)	-0.026 (0.029)
Underfunding	-0.027 c (0.015)	-0.025 (0.017)	-0.028 (0.016)	-0.027 (0.018)	-0.033 b (0.015)	-0.036 c (0.018)
Wage>PBGC	0.009 (0.014)	0.122 a (0.033)	0.007 (0.013)	0.124 a (0.034)	0.005 (0.014)	0.123 a (0.031)
Low Cash Flow × Underfunding	-0.004 (0.014)	0.010 (0.016)	-0.018 (0.019)	-0.004 (0.020)	-0.016 (0.019)	-0.002 (0.020)
(Wage>PBGC) × Underfunding	0.046 (0.026)	0.040 c (0.021)	0.050 c (0.027)	0.045 c (0.021)	0.053 b (0.024)	0.050 b (0.020)
Low Cash Flow × (Wage>PBGC)	0.058 c (0.031)	0.063 c (0.034)	0.051 c (0.028)	0.056 (0.032)	0.055 c (0.028)	0.060 c (0.031)
Low Cash Flow × Underfunding × (Wage>PBGC)	-0.100 a (0.019)	-0.114 a (0.021)	-0.097 a (0.019)	-0.111 a (0.020)	-0.104 a (0.019)	-0.118 a (0.021)
Adjusted R^2	0.09	0.15	0.08	0.14	0.07	0.13
Fixed-Effects						
Year	No	No	No	No	No	No
Airline	Yes	No	Yes	No	Yes	No
Plan	No	Yes	No	Yes	No	Yes
# of airlines	12	12	12	12	12	12
# of plans	46	46	46	46	46	46
Observations	476	476	476	476	476	476

Table 10:
Labor Unionization

This table provides the percentage of labor that is unionized in each firm. For those firm-year observations in which there is no detailed information, a dummy variable is used which takes a value of 1 if the firm has three or more unions and 0 otherwise.

Airline	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Alaska Airlines	1	1	87%	88%	87%	86%	84%	84%	1	84%	83%
American Airlines	1	1	1	1	1	1	1	1	1	1	1
Continental Airlines	1	1	1	1	1	1	1	44%	1	42%	1
Delta Airlines	0	0	0	0	14%	16%	0	18%	18%	18%	18%
Federal Express	0	0	0	0	0	0	0	0	0	0	0
Hawaiian Airlines	1	1	1	1	1	1	1	1	1	1	85%
Midwest Express	0	0	0	0	0	1	1	1	33%	1	35%
Northwest Airlines	1	1	1	1	1	1	1	1	1	1	1
Trans World Airlines	1	1	1	1	1	1	-	-	-	-	-
United Airlines	1	1	1	1	1	1	1	1	1	78%	80%
United Parcel Services	1	1	1	1	1	60%	60%	64%	1	64%	1
US Airways	69%	68%	65%	84%	84%	85%	86%	83%	84%	84%	81%

Table 11:
Wages, Underfunding, Bankruptcy and PBGC Coverage

The dependent variable in all regressions is the relative change in (Wages/Employees). All regressions include an intercept (not reported). Standard errors are calculated by clustering at the airline level.

Dependent Variable=	% change in wages/ employees	% change in wages/ employees	% change in wages/ employees	undefunding>		
				10%	15%	25%
	% change in wages/ employees	% change in wages/ employees	% change in wages/ employees	% change in wages/ employees	% change in wages/ employees	% change in wages/ employees
Ln(Assets)	0.000 (0.005)	0.058 b (0.022)	0.045 c (0.021)	0.045 c (0.023)	0.039 c (0.022)	0.043 (0.024)
Leverage	0.097 (0.076)	0.109 (0.075)	0.123 (0.078)	0.130 (0.074)	0.118 (0.070)	0.123 (0.071)
Market-to-Book	0.018 (0.015)	0.043 (0.027)	0.031 (0.031)	0.027 (0.029)	0.026 (0.029)	0.028 (0.027)
Wage Share	-0.017 (0.017)	-0.022 (0.023)	1.064 b (0.384)	1.096 b (0.370)	1.076 a (0.341)	1.074 a (0.341)
Profitability	0.164 (0.108)	0.213 c (0.111)	0.185 (0.110)	0.162 (0.117)	0.143 (0.100)	0.152 (0.099)
Bankruptcy	-0.088 a (0.009)	-0.138 a (0.027)	-0.113 b (0.045)	-0.113 b (0.037)	-0.093 c (0.044)	-0.082 (0.053)
Underfunding	-0.014 (0.020)	-0.045 c (0.025)	-0.041 (0.025)	-0.019 (0.016)	-0.006 (0.024)	-0.030 c (0.014)
Wage>PBGC	0.015 (0.014)	0.013 (0.014)	0.123 a (0.037)	0.131 a (0.038)	0.132 a (0.042)	0.134 b (0.045)
Bankruptcy × Underfunding	0.003 (0.031)	0.068 b (0.031)	0.060 (0.043)	0.071 a (0.022)	0.044 (0.027)	0.044 (0.044)
(Wage>PBGC) × Underfunding	0.023 (0.027)	0.040 (0.033)	0.032 (0.033)	0.020 (0.027)	0.016 (0.022)	0.034 (0.033)
Bankruptcy × (Wage>PBGC)	0.048 (0.032)	0.075 c (0.035)	0.069 b (0.028)	0.048 (0.027)	0.082 b (0.031)	0.056 b (0.023)
Bankruptcy × Underfunding × (Wage>PBGC)	-0.095 (0.058)	-0.128 b (0.054)	-0.115 c (0.063)	-0.100 c (0.051)	-0.164 b (0.059)	-0.148 c (0.068)
Adjusted R^2 Fixed-Effects	0.13	0.15	0.19	0.19	0.19	0.19
Year	Yes	Yes	Yes	Yes	Yes	Yes
Airline	No	Yes	No	No	No	No
Plan	No	No	Yes	Yes	Yes	Yes
# of airlines	12	12	12	12	12	12
# of plans	46	46	46	46	46	46
Observations	470	470	470	470	470	470

Table 12:
Wages, Underfunding, Bankruptcy and PBGC Coverage (Including Industry Controls)

The dependent variable in all regressions is the relative change in (Wages/Employees). All regressions include an intercept (not reported). Standard errors are calculated by clustering at the airline level.

Dependent Variable=	Industry Control					
	M-to-B (12 Firms)		Avg. Fuel Cost		Profitability	
	% change in wages/ employees	% change in wages/ employees	% change in wages/ employees	% change in wages/ employees	% change in wages/ employees	% change in wages/ employees
Ln(Assets)	0.037 (0.030)	0.026 (0.028)	0.017 (0.025)	0.005 (0.025)	0.007 (0.022)	-0.007 (0.019)
Leverage	0.169 b (0.060)	0.174 b (0.060)	0.143 b (0.062)	0.148 b (0.061)	0.115 c (0.059)	0.116 c (0.061)
Market-to-Book	0.013 (0.024)	-0.001 (0.021)	0.006 (0.023)	-0.010 (0.022)	0.004 (0.027)	-0.014 (0.028)
Profitability	0.153 (0.104)	0.135 (0.108)	0.081 (0.098)	0.056 (0.102)	0.100 (0.104)	0.080 (0.109)
Wage Share	-0.015 (0.025)	1.080 a (0.350)	-0.016 (0.025)	1.048 b (0.352)	-0.017 (0.024)	1.026 b (0.351)
Industry Control	-0.103 c (0.048)	-0.119 c (0.054)	-0.016 (0.025)	-0.023 (0.023)	-0.146 (0.161)	-0.167 (0.166)
Bankruptcy	-0.135 a (0.017)	-0.106 b (0.036)	-0.143 a (0.016)	-0.110 a (0.032)	-0.154 a (0.014)	-0.122 a (0.034)
Underfunding	-0.028 (0.020)	-0.019 (0.019)	-0.031 (0.021)	-0.023 (0.021)	-0.036 c (0.020)	-0.032 (0.021)
Wage>PBGC	0.014 (0.012)	0.123 a (0.036)	0.011 (0.013)	0.121 a (0.035)	0.009 (0.011)	0.120 a (0.034)
Bankruptcy × Underfunding	0.062 b (0.025)	0.051 (0.036)	0.055 b (0.024)	0.041 (0.036)	0.055 c (0.027)	0.039 (0.040)
(Wage>PBGC) × Underfunding	0.039 (0.030)	0.027 (0.030)	0.043 (0.031)	0.032 (0.031)	0.047 (0.029)	0.038 (0.030)
Bankruptcy × (Wage>PBGC)	0.074 c (0.040)	0.055 c (0.026)	0.074 (0.043)	0.052 (0.030)	0.077 c (0.042)	0.057 c (0.028)
Bankruptcy × Underfunding × (Wage>PBGC)	-0.117 b (0.045)	-0.089 (0.050)	-0.123 b (0.054)	-0.093 (0.060)	-0.130 b (0.051)	-0.102 (0.061)
Adjusted R^2 Fixed-Effects	0.13	0.17	0.12	0.16	0.12	0.16
Year	No	No	No	No	No	No
Airline	Yes	No	Yes	No	Yes	No
Plan	No	Yes	No	Yes	No	Yes
# of airlines	12	12	12	12	12	12
# of plans	46	46	46	46	46	46
Observations	470	470	470	470	470	470