MUTUAL GAINS OR ZERO SUM? LABOR RELATIONS AND FIRM PERFORMANCE IN THE AIRLINE INDUSTRY

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The authors examine competing theoretical arguments regarding whether union representation, shared governance, wage levels, and two features of the quality of labor relations—workplace culture and conflict in negotiations—lead to better or worse outcomes for airlines, and they test these interpretations using a mix of historical and quantitative data from major U.S. airlines. Both the qualitative and quantitative results suggest that relational factors—conflict and workplace culture—are more important determinants of performance than the structural factors of unionization, shared governance, and wages. The authors conclude that efforts to recover from the current crisis in the airline industry that depend primarily on reductions in wages or union power will at best bring only short-term relief from immediate financial pressures. Sustained improvement in service quality and financial performance will require more fundamental improvements in the quality of labor relations.

The airline industry's labor relations have long been characterized as contentious and adversarial. The battles between labor and management in the first decade of deregulation are legendary and continue to leave a residual bitterness and mistrust throughout the industry. Even before the terrorist attacks of September 11, 2001, the labor relations system envisioned and governed by the Railway Labor Act of 1926 was experiencing increasing strains, as evidenced by an increase in the time required to reach labor agreements, high rejection rates of new agreements by rank-and-file members, increased numbers of highly visible job actions that frustrated

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customers and contributed to an already low and declining level of customer satisfaction, increased use of the Act's emergency procedures to avoid work stoppages, a pattern bargaining structure that more often paralyzed negotiations than pointed to acceptable settlements, and a deteriorating economy and market for airline travel.

Thus, it is not surprising that when the terrorist attacks led to a dramatic decline in air travel demand and confronted major airlines with billions in financial losses, the poor state of labor relations was seen as one of the key obstacles to the restructuring that appeared necessary. Some financial analysts and industry managers saw the post-attack period as an opportunity to reign in the power and wages of airline labor (Barakat 2001). And yet some airlines seem to perform quite well with unionized, well-compensated employees, even in difficult times.

In addressing the industry's current and future labor relations, the question must be asked whether airline labor relations are a zero sum game or whether, instead, there are opportunities for mutual gains. Do reductions in union representation or wages improve outcomes for firms? Does shared governance improve outcomes for either party? Finally, what are the effects of reducing union-management conflict or strengthening workplace culture? While traditional adversarial relations continue to be the norm in the airline industry (Johnson 2001), there has actually been important variation since deregulation both across firms and within firms over time on important dimensions of labor relations. This paper uses this historical firm-level variation to understand more clearly the relationship between labor relations and airline performance.

In the first section, we frame the competing arguments regarding whether structural elements of labor relations such as union representation, shared governance, and wages lead to better or worse outcomes for airlines. We then discuss how the underlying quality of workplace relations and union-management negotiations may affect performance outcomes. In the second section, we contribute to answering these empirical questions by drawing on a mix of (1) qualitative profiles of airlines that illustrate the variation in labor relations strategies and practices over the past twenty years, and (2) quantitative data covering ten major airlines over the past 14 years. We conclude by using the insights gained from these combined quantitative and qualitative analyses to suggest steps the various parties might take to recover from the industry's current crisis and to begin a process of long-term performance improvement.

Labor Relations and Firm Performance: Competing Theoretical Arguments

The Structure of Labor Relations

The nature of the relationship between firms and employees should be especially important in the airline industry, given its service-intensive nature, the relatively high ratio of labor costs to total costs, and the high level of union representation in the industry. Since labor costs account for roughly one-third of an airline's costs and unions represent approximately 40% of the overall air transport industry's employees and over 60% of the non-managerial employees of the major airlines (Johnson 2001; Hirsh and Macpherson 2000), employees have the ability to affect airline performance in significant ways. Through collective bargaining, employees can achieve higher wages and employment security, leaving firms with higher costs and less operating flexibility. As in other industries, a union wage premium has been well documented in airlines (Cremieux 1996; Card 1998; Hirsch and Macpherson 2000). Furthermore, employees can impose additional costs in the process of setting those wages and employment conditions, through strikes or other service disruptions. Thus, employee gains in bargaining power and wages could be seen as necessarily detrimental to both service quality and financial performance.

However, at the same time, employees can also contribute positively to airline performance. For one thing, unions and the

wage premiums that they achieve put pressure on management to increase productivity through more efficient or effective use of labor or capital resources (Slichter, Healy, and Livernash 1960; Freeman and Medoff 1984). Furthermore, union representation, by providing employees with enhanced job security and bargaining power, may make employees more willing to exert discretionary effort. As in other service industries (Heskett, Sasser, and Schlesinger 1997; Loveman 1998), employees in airlines interact directly with customers, and therefore employees' motivation and satisfaction with their workplace are likely to have important effects on an airline's quality of service and resulting customer satisfaction (Gittell 2003). Thus, while treating employees as costs to be minimized might be expected to lead to lower service quality and lower productivity, efforts to build a positive workplace culture by encouraging employee participation in problem-solving and teamwork might be expected to lead to higher service quality and higher productivity. Whether these hypothesized quality and productivity improvements made possible through union representation are large enough to offset the wage premium and thus increase firm profits is ultimately an empirical question.

One of the more interesting labor relations experiments in the airline industry has been shared governance, in which employees collectively own a large equity stake and are represented on the board of directors. Here, too, the effects on firm performance are an empirical question. On the one hand, increased employee influence in the firm's governance could be expected to lead to high labor costs stemming from some combination of higher wages, greater employment security and staffing levels, and more work rules. Some financial analysts complain that shared governance is merely a situation in which "the inmates are running the asylum" (Wong 2002). On the other hand, increased employee voice and participation in corporate governance may, if reinforced with comparable efforts throughout the organization, lead to increased employee motivation, and thus higher service quality and productivity (Hammer and Stern 1986; Kochan, Katz, and McKersie 1986; Levine and Tyson 1990; Blasi and Kruse 1991). Moreover, since shared governance arrangements in this industry are often achieved as a quid pro quo for wage concessions, the short-run effect should be to lower wages. Which effects predominate in actual experience is another empirical question that will be explored in our analysis.

The Quality of Labor Relations

The above discussion focused specifically on structural elements of labor relations—union representation, shared governance, and wages—which together reflect the extent to which employees have formal bargaining power or a role in the governance structure. But some research on labor relations and firm performance suggests that it may not be the formal structure of the labor-management relationship per se, but the underlying *quality* of the relationship, that most strongly affects firm performance (Kochan, Katz, and McKersie 1986; Ichniowski, Shaw, and Prenushi 1996; Gittell 2003). This view emphasizes the interconnections among three levels of activity in a labor relations system: the workplace, collective bargaining, and strategic decision-making. Building a workplace culture of high trust and implementing practices that involve employees in solving operational problems are expected to create a conducive climate for negotiating collective bargaining agreements expeditiously and with less need for detailed work rules (Katz, Kochan, and Gobeille 1983). The alternative of maintaining a more traditional adversarial relationship at the workplace risks setting in motion a self-perpetuating low-trust/high-conflict labor-management relationship both in day-to-day workplace relations and in contract negotiations. The evidence from other industries suggests that low trust and high conflict combine to have substantial negative effects on performance outcomes (Ichniowski, Kochan, Levine, Olson, and Strauss 1996).

Similarly, the absence of unions per se is

not likely to have as determinative an effect on employee or firm outcomes as do the *methods* used to avoid union representation. The labor relations literature differentiates between two union avoidance strategies: union substitution and union suppression (Kochan 1980). Union substitution strategies seek to reduce the motivation to join a union by providing wages, employment security, and working conditions equal to or better than those achieved in union settings in the hopes of balancing these higher costs against the higher productivity that might result from having more flexibility in organizing and reorganizing the production process. Union suppression strategies, as the label implies, involve fighting union representation efforts more directly by taking actions (legal or illegal) to defeat union organizing drives or to decertify existing unions in order to keep labor input costs low. The latter approach is likely to create or perpetuate a low-trust relationship at the workplace that avoids the overt conflicts that might occur in collective bargaining negotiations but fail to gain benefits from a highly motivated and committed work force.

Our analysis, then, seeks to contribute empirical evidence on the relationship between structural employee gains—union representation, shared governance, wages—and airline performance as well as on the combined effects of the structural and the non-structural factors on airline performance

Methods and Data

This study is part of a larger on-going study of the global airline industry at MIT sponsored by the Alfred P. Sloan Foundation. Like other Sloan industry studies (Cohen 1998), this project involves both a multi-disciplinary team of academics (in this case, engineers, economists, and employment/labor relations faculty) and active participation of industry, labor, and government practitioners and policy leaders. The active participation of these professionals provides access to data and interactions that would otherwise not be available through published sources or less sustained contacts and interactions. Therefore the qualitative and quantitative data for the analyses draw on a diverse range of sources and methods.

Historical profiles of the labor relations developments since deregulation in 1978 are drawn from an archival data base built from published information (news reports, company reports, research articles, and so on) and company and union documents. Data on length of labor contract negotiations for the major airlines were obtained from the files of the Airline Labor Relations Conference (AIRCon), the industry's leading labor relations association. From the project's inception in 2000 to the present, interviews have been conducted with management representatives from each of the major airlines, leaders of the three largest unions (the Air Line Pilots Association, the Association of Flight Attendants, and the International Association of Machinists) in the industry, and the staff and members of the National Mediation Board (NMB), the agency responsible for enforcing the labor relations statute and impasse resolution procedures governing this industry. Further data were collected and preliminary results of our analyses were reported and discussed with industry, labor, and government leaders at meetings of the project's industry advisory board, as well as at two meetings that specifically brought the industry's labor relations and union leaders together with officials of the NMB to discuss the state of labor relations.

The sample for the quantitative portion of the study includes quarterly data from the final quarter of 1987 through the first quarter of 2000 (50 quarters) for the domestic operations of all U.S. passenger airlines classified as major carriers (revenues greater than $1 billion) in 2000. The airlines included are Alaska Airlines, American Airlines, America West Airlines, Continental Airlines, Delta Airlines, Northwest Airlines, Southwest Airlines, Trans World Airlines, United Airlines, and US Airways. The unit of analysis is the airline-quarter. Our data set thus includes 10 airlines for 50 quarters each, yielding 500 airline-quar-

ters. The time period was determined by data availability.

Most of these data are taken from the Department of Transportation's Form 41. Form 41 includes quarterly financial and operating data since prior to deregulation (1978), as well as annual employment data since 1985. Service quality data come from the Federal Aviation Administration, which has reported pilot safety deviations by airline and by the date of occurrence since 1985, and the Air Travel Consumer Report (ATCR), which has provided monthly service quality data since the third quarter of 1987. That quarter marks the beginning of our data set.

Union representation and union-management conflict variables are constructed from archival data maintained by AIRCon, and the dates of shared governance are determined from media reports.

Dependent Variables

Wages. Our wage measure is the sum of the wage and salary costs for all key operating personnel (flight personnel, maintenance personnel, and ground personnel), divided by the total number of employees in those key groups, using Form 41 data. The same wage measure is also used as an independent variable in our models, as we seek to understand the independent effects of wages, union representation, and shared governance on firm performance. Wages are log transformed in all models, in keeping with standard practice.

Service quality. Service quality is defined as the safety and reliability of the travel experience. Employees can influence service quality in this industry either through their direct interactions with customers or through the indirect impact of their actions on the customer experience (loading or failing to load a bag, adhering to or violating safety procedures, and so on). Safety is measured negatively as the number of pilot safety deviations per million departures, using FAA data. Reliability is measured negatively as late arrivals (percent of flights arriving more than 15 minutes late); lost bags (number of mishandled bags per thousand passengers); and complaints per million passengers, using Air Travel Consumer Report data. These measures were normalized and then combined into a single index called service failure. Cronbach's alpha for this index is 0.87.

Labor productivity. Labor productivity is typically measured as a ratio of output to labor input. Often, airline labor productivity is measured as total revenue passenger miles (RPM) per employee (Hirsch and Macpherson 2000; Oum and Yu 1998). However, not all airline employees have clear effects on the carrier's RPM output. We measure labor productivity separately for each employee craft, using Form 41 data. For pilots, we measure flight miles per pilot. For flight attendants, we measure revenue passenger miles per flight attendant. For mechanics, we measure departures per mechanic. Similarly, for dispatchers, we measure departures per dispatcher. For ground personnel, we measure number of passengers enplaned per ground employee. Our final measure of labor productivity is an index of these six productivity measures, weighted according to the size of each employee group. Cronbach's alpha for this index is 0.84.

Despite our craft-specific level of detail, these measures of output per employee are significantly affected not only by a carrier's route system and fleet composition (which we control for with average flight length and size), but also by staffing levels either mandated for safety purposes or negotiated in collectively bargained contracts. Thus, firm-level variations in labor productivity may reflect different staffing requirements more than differences in employee motivation and discretionary effort. Because of this, we also use a measure of aircraft productivity, as described below.

Aircraft productivity. Aircraft productivity is computed as block hours per aircraft day, where block hours are the hours between pulling back from the airport gate and arrival at the down-line airport gate, using Form 41 data. These are the hours that an aircraft is considered to be in a revenue-producing mode. While this ratio does not include a measure of labor input, aircraft

utilization can be strongly affected by the extent to which employees cooperate, coordinate, and exert discretionary effort in getting planes loaded and turned around quickly (Gittell 2001; Knez and Simester 2001).

Operating margin. Operating margin is measured as operating income divided by operating revenues, using Form 41 data. Return on assets was also considered, but was highly correlated with operating margin (0.96 correlation coefficient) and therefore is not included in the analysis.

Independent Variables

Union representation. The level of union representation in a given quarter at each airline is measured by the number of unionized pilots, flight attendants, maintenance personnel, dispatchers, ramp personnel, and customer service personnel, divided by total airline employment, based on archival data from the Airline Industrial Relations Conference. When there is a newly unionized workgroup during the study period, we measure union representation starting with the date the first contract is ratified, to account for the time lag between certification and contract completion.

Shared governance. Shared governance is measured by a dummy variable equal to 1 in each quarter in which employees own equity and nominate at least one voting member of the board of directors of an airline, based on historical data.

Union-management conflict. We measure union-management conflict as the number of releases[1] and strikes that occurred at a given airline in a given quarter, based on archival data from the Airline Industrial Relations Conference.

Workplace culture. Workplace culture is measured in a very rough way. Based on the airline profiles that will be discussed below, we created a dummy variable for workplace culture that is equal to 1 for Southwest Airlines throughout the sample period; for Continental Airlines starting in late 1994, to reflect the new culture introduced at that time; and for Delta Airlines up to the end of 1994, when a series of management initiatives discussed below undermined the strong culture that Delta was known for. Otherwise this variable is equal to 0.

Control Variables

To control for other firm-specific factors that may influence the dependent variables, we include measures of capital intensity (capital assets per employee), average flight length (miles flown per flight departure), aircraft size (seats per aircraft),[2] and employment growth (change over the past year in employment, divided by the number employed one year ago). All of these control variables are measured using Form 41 data. Finally, to account for factors that might affect the industry as a whole in certain time periods, we include dummy variables for each quarter in the sample.

Model Specification

All models tested here use airline-quarter as the unit of analysis. For testing these models, we use random effects regressions. Treating each airline as the random effect allows our coefficients to reflect variation both within and across airlines (Hausman 1978). We also tested our models using fixed effects regressions in which coefficients reflect variation within airlines only. The fixed effects results are less efficient, because they discard information regarding differences across airlines. We there-

[1]Under the Railway Labor Act, the regulatory regime for airlines and railroad labor relations, the National Mediation Board grants a release after its members determine that no progress is being made in contract negotiations. A release signifies that the parties are released to self-help, including the ability to conduct a strike, after a 30-day cooling off period.

[2]"Seats per aircraft" is computed indirectly, using available data. If the number of passengers enplaned is 100, and the load factor (revenue passenger miles divided by available seat miles) is 80%, this suggests that seats per aircraft is 100/.80 = 125.

fore do not present the fixed effects results systematically, but we do note when the results differ in interesting ways from the random effects results.[3]

Qualitative Results: Selected Profiles of Labor Relations and Firm Performance

Our first analytic step is to look at the experiences of several airlines that have been outliers on the relevant dimensions of labor relations to illustrate the potential performance effects of alternative labor relations regimes.

Unionization and Union Avoidance Strategies: Delta and the "Old" Continental

Most of the major U.S. carriers are heavily unionized. The two major exceptions have been Delta and Continental. However, the differences between these carriers' approaches to union avoidance seem to have led to very different outcomes.

With the exception of its pilots and dispatchers, Delta has remained non-union by following a union substitution strategy. Delta's historic approach to labor relations involved an implicit commitment to high wages, lifetime employment, and a "family" culture with the intention of avoiding union representation and eliciting high levels of service from its employees. For example, Delta's first unprofitable year came during the industry slump in 1982, but in that year Delta made good on its implicit no-layoffs promise and even gave employees an average raise of 8.5%. In return, employees jointly purchased a $30 million jet for the carrier as a token of appreciation (*Financial Times* 1982).

For a long time, this approach helped Delta maintain a reputation as a high-quality, high-service carrier. But in 1994, after four consecutive years of losses, the carrier broke its implicit guarantee when it laid off 15,000 employees and unilaterally cut wages. Not surprisingly, Delta's service levels quickly deteriorated, and its level of passenger complaints rose above the industry average, after having long been below average. The underlying relationship was clearly of some importance. As part of its return to financial health, Delta also strove to re-establish its good relationship. By 2002 it had significantly improved its service levels.

Frank Lorenzo's tenure at Continental, on the other hand, is a prime example of a union suppression strategy. In 1981, Lorenzo acquired ailing Continental Airlines and demanded drastic wage cuts. When such concessions were not forthcoming from the unions, Continental filed for bankruptcy in 1983, abrogated its labor contracts, and offered its employees continued employment only at half of their previous wages. The unions responded by striking, but Continental restored operations quickly with replacement employees, and eventually broke the strike and withdrew recognition of the pilots' and mechanics' unions.

However, Continental's union suppression strategy did not produce sustained positive performance. While labor costs were vastly reduced, service quality declined precipitously, to the point that Continental experienced a passenger complaint rate consistently far above the industry average from 1983 through 1991. Furthermore, by 1991 it was back in bankruptcy. These cases suggest that the absence of unions per se does not cleanly predict good or bad performance. Rather, differences between the firms' strategies, which led to major differences in the quality of the relationship between labor and management, had a stronger effect on firm performance.

Shared Governance: United, Northwest, Eastern, and Western

While shared governance provisions represent structural changes at the strategic level of labor relations that should support and reinforce efforts to improve and trans-

[3]Complete fixed effects results are available from the authors upon request.

form the relationship between labor and management, the airline industry's actual experiences have failed to live up to such promises. United is perhaps the most famous case of employee ownership of an airline, but there have been at least four other examples among major carriers since deregulation. Western (1984–1986), Eastern (1984–1986), Northwest (1993–present), TWA (1992–2001), and United (1994–present) all implemented Employee Stock Ownership Plans (ESOPs), whereby employees collectively owned a significant share of the airline's equity through their retirement plans and had the right to nominate one or more members of the firm's Board of Directors.

Four of these five arrangements—those at Western, Eastern, Northwest, and TWA—were essentially a trade of wages for equity in order to stave off an impending bankruptcy. Even at United, while the airline was not facing dire financial straits, the ESOP was mostly a trade of equity for wage reductions to develop a competitive United Shuttle operation. Thus, shared governance typically has not been initiated as a strategy for improving the performance of a healthy company or for achieving a cultural or operational transformation, but rather as a necessary evil, and it was viewed primarily as a financial deal.

Nevertheless, each of the ESOP companies experienced an initial burst of cooperation and improved labor relations. For example, within a year of the adoption of its ESOP, Eastern was being heralded as a national example of how employee involvement at the workplace, more cooperative labor relations, and employee voice in strategic decision-making could transform a failing company into one with a bright future (Petzinger 1996; Blasi and Gasaway 1995). At United, efforts to introduce interest-based negotiations and other labor-management innovations occurred in the years immediately after the ESOP (Kochan 1999).

But in all these cases, improvements in labor relations were short-lived, swamped by the mistrust that came back during subsequent contract negotiations. United and Northwest, the two carriers that survived independently long enough to negotiate a post-ESOP contract, illustrate the pattern most vividly. At United, negotiations on the first post-ESOP contracts led to job actions by pilots and mechanics. Pilots began refusing overtime assignments in the summer of 2000, contributing to a drastic drop in United's on-time performance and cancellation of 5,000 flights per month between May and August 2000 (*Newsday* 2001). After the pilots settled, the mechanics launched a set of slowdowns (Carey 2001). Not only did the mechanics' contract go to a Presidential Emergency Board (PEB) in early 2002, but even the PEB's recommended settlement was rejected by the rank and file before the parties finally settled in the spring of 2002. Relations at Northwest, too, reverted to old patterns of conflict when post-ESOP negotiations began in 1996. Northwest's pilots went on strike for 14 days in 1998, the flight attendants' contract did not settle until four years later in 2000, and the mechanics' contract only settled in 2001.

United, Eastern, Western, and Northwest all did experience improved financial results upon implementation of their ESOPs. Western, Eastern, and Northwest all staved off bankruptcy, and Western and Northwest even returned to positive profitability. United enjoyed substantial profitability from 1995 through 1999. However, these financial gains were largely the result of the wage concessions rather than improved productivity. United, for example, was no more profitable than its main competitors during this period, despite its significant wage reductions. In fact, the bulk of United's profit between 1994 and 1999 came from wage savings through the ESOP and regional jet operations (Kochan 1999). Given the failure to use these shared governance arrangements to transform other aspects of the labor-management relationship, it is not surprising that the financial gains from the wage reductions were short-lived.

The key lesson from a closer look at the ESOP experiences in airlines supports the view expressed by those who have exam-

ined these arrangements in other settings, namely that a one-time change in the formal governance structure cannot, by itself, sustain a long-term improvement in firm performance (Hammer and Stern 1986; Levine and Tyson 1990; Blasi and Kruse 1991). In fact, without an accompanying improvement in the underlying relationship between employees and management, shared governance can lead to a worsening of the labor-management relationship because of disappointed expectations.

Workplace Culture and Labor-Management Conflict: Southwest and the "New" Continental

Finally, two other airlines positively illustrate the likely importance of the quality of labor relations, independent of the structural aspects. Southwest and the "new" Continental both stand out for their extended periods of low conflict in contract negotiations, underpinned by high-trust workplace cultures.

Southwest Airlines. By almost any measure, Southwest has been the highest-performing firm in the airline industry. As shown in Table 1, from 1987 to 2001 Southwest had the highest operating margins (and the lowest variance), the lowest service failure rate, the highest labor productivity, and the second highest aircraft productivity, despite its reliance on short haul flights, which tend to reduce productivity. The company attributes part of its superior performance to the quality of its relationship with employees (Brooker 2001).[4] In 1998, Southwest topped *Fortune*'s list of the Best Companies to Work For, and was in the top 4 in 1999, 2000, and 2001.

The sources of this good relationship are several, varied, and intimately interrelated. One hard-to-imitate factor may be the charismatic leadership of CEO Herb Kelleher. But Southwest has also adopted organizational practices to institutionalize its good intrafirm relations, including profit-sharing, extensive communication with employees, high levels of supervisory involvement with front-line employees, selective recruitment for teamwork skills, flexible work rules, and the use of cross-functional performance measures (Gittell 2000, 2001, 2003). These practices support a high level of trust and cooperation among employees and between employees and their managers, contributing to faster aircraft turnarounds (and therefore higher aircraft productivity), higher labor productivity, and higher levels of service quality (Gittell 2001).

Continental Airlines. Continental is also now known for having a high-quality workplace culture and low levels of conflict. But in the case of Continental this period was preceded by a long period of intense conflict, as described above. After emerging from its second bankruptcy in 1993, Continental was headed for its third bankruptcy by late 1994, when Gordon Bethune took over as CEO and began a remarkable turnaround. By 1995 Continental achieved the highest profits in its history, by 1997 it was rated the top long-haul airline by J.D. Powers, and by 1999 it had re-established itself as a profitable carrier consistently ranking near the top in most service categories. Whereas Continental's relative level of complaints was extraordinarily high during the anti-union era of 1983 to 1991, it then dropped below the industry median after 1994.

Like Southwest, the new Continental seems to enjoy greater trust between labor and management. Turnover, sick leave, and absentee rates have all dropped dramatically since 1994 (Continental Airlines 2001). Since 1991 both the pilots and mechanics have re-unionized, but contract negotiations have been smooth and relatively short. And while Continental's labor contracts have raised wages significantly, they have also kept fewer work rules than average, which allows Continental to operate more efficiently than its rivals (McCartney 1998).

Southwest and the new Continental also negotiate labor contracts more quickly and

[4]Among other oft-cited operational factors in Southwest's performance are its point-to-point service, its use of a single aircraft model, and its use of less-congested secondary airports.

Table 1. Means and Standard Deviations, by Carrier.

Independent Variable	*ALA*	*AMR*	*AMW*	*CON*	*DEL*	*NWA*	*SWA*	*TWA*	*UNI*	*USA*	*All*	*Min*	*Max*	*Obs*
Union Representation	.82	.62	.29	.25	.16	.85	.88	.82	.55	.51	.58	.12	.89	500
	(0)	(0)	(.12)	(.10)	(.07)	(0)	(.01)	(0)	(.05)	(.07)	(.27)			
Shared Governance	0	0	0	0	0	.52	0	.62	.46	0	.16	0	1	500
	(0)	(0)	(0)	(0)	(0)	(.50)	(0)	(.49)	(.50)	(0)	(.37)			
Conflict	.06	.06	.02	.04	0	.08	0	0	.04	.06	.04	0	2	500
	(.24)	(.24)	(.14)	(.20)	(0)	(.34)	(0)	(0)	(.20)	(.24)	(.20)			
Workplace Culture	0	0	0	.44	.54	0	1.00	0	0	0	.20	0	1	500
	(0)	(0)	(0)	(.50)	(.50)	(0)	(0)	(0)	(0)	(0)	(.40)			
Wages	51,948	55,740	36,125	55,453	56,629	66,724	49,847	49,383	74,251	65,553	56,206	29,817	100,271	489
	(11,144)	(4,601)	(4,223)	(6,983)	(8,477)	(10,640)	(11,036)	(10,273)	(7,472)	(10,595)	(13,446)			
Service Failure	–.19	–.01	.05	.37	–.27	.08	–.63	.68	.05	–.14	0	–.91	5.32	500
	(.44)	(.40)	(.53)	(1.13)	(.22)	(.80)	(.19)	(.90)	(.42)	(.36)	(.70)			
Aircraft Productivity	10.1	9.7	11.2	9.4	10.0	9.1	10.9	9.3	9.7	9.2	9.9	7.02	12.78	500
	(1.2)	(0.3)	(0.8)	(0.6)	(0.3)	(0.4)	(0.3)	(0.5)	(0.3)	(0.3)	(0.9)			
Labor Productivity	–.41	–.42	.81	.17	–.48	–.08	1.28	–.27	.15	–.15	.06	–1.45	2.14	495
	(.50)	(.33)	(.40)	(.21)	(.44)	(.25)	(.42)	(.32)	(.40)	(.37)	(.66)			
Operating Margin	.037	.053	.044	.099	.056	.056	.110	–.022	.032	.027	.037	–.33	.21	500
	(.096)	(.060)	(.076)	(.067)	(.067)	(.090)	(.051)	(.085)	(.063)	(.084)	(.082)			
Capital Intensity	165,305	246,886	117,181	160,096	171,640	296,349	181,275	149,802	211,846	165,920	186,630	76,177	419,341	500
	(21,849)	(74,016)	(28,617)	(40,808)	(58,607)	(76,348)	(14,416)	(25,148)	(64,508)	(41,107)	(69,519)			
Leg Length	649	889	656	797	653	688	400	725	847	515	682	369	1,040	500
	(74)	(123)	(127)	(83)	(39)	(38)	(32)	(27)	(48)	(48)	(157)			
Aircraft Size	102.5	139.9	121.7	119.3	138.2	117.0	109.7	120.2	135.1	105.8	120.9	86	155	500
	(11.6)	(3.8)	(6.4)	(3.7)	(9.4)	(4.3)	(3.4)	(4.7)	(4.9)	(6.1)	(14.0)			
Employment Growth	.08	.03	.22	.02	.02	.03	.15	–.01	.03	.10	.07	–.26	1.90	500
	(.06)	(.10)	(.55)	(.18)	(.13)	(.04)	(.07)	(.06)	(.08)	(.24)	(.02)			

with a lower probability of resort to the NMB procedures or work disruptions than their rivals. Data measuring the length of time between the amendable date of an existing contract and the ratification date of the next contract show that between 1984 and 2000, major carriers and unions took an average of 17.5 months to reach a new agreement. Southwest and Continental were on the low end of the industry's distribution (5.1 and 8.5 months, respectively) while U.S. Airways, United, TWA, and Northwest were at the other end of the distribution (ranging between 20 and 22 months). Not surprisingly, these cross-firm variations in negotiation length are closely related to the probability of either a work disruption (strike, lockout, or slowdown) or the need for NMB intervention.

Summary

Our qualitative analysis seems to confirm the argument that variations in structural factors of labor relations are less determinative of firm performance than the quality of the underlying relationship. Having a low unionization rate can translate into superior or inferior performance, depending on the approach to union avoidance. Shared governance offered some initial gains that were, however, short-lived, as they were unsupported by improvements in the relationship. Carriers with positive workplace cultures and low levels of conflict in negotiations seemed to enjoy high performance.

In the next section, we test these relationships more systematically with quantitative data on ten firms over fourteen years. Specifically, we ask four questions: (1) Is variation in union representation associated with variation in service quality, productivity, and profits? (2) Are firm-level wage variations associated with firm-level variations in service quality, productivity, and profits? (3) Is shared governance associated with higher or lower service quality, productivity, and profits? (4) Are variations in the degree of conflict in labor negotiations or in the quality of the workplace culture associated with variations in service quality, productivity, or profits, and do they change the relationships between the structural factors and airline performance? As noted above, our productivity measures include both labor *and* aircraft productivity because both can be significantly affected by the extent to which employees cooperate, coordinate, and exert discretionary effort in getting planes loaded and turned around quickly (Gittell 2001; Knez and Simester 2001).

Quantitative Results

Means, standard deviations, and ranges are reported in Table 1 for each variable in our models, both for individual airlines and for the sample as a whole. Zero-order correlations are reported on Table 2.

The Structure of Labor Relations

We first consider only the structure of labor relations and its impact on firm performance, without accounting for the impact of conflict and culture. Columns (1a)–(5a) of Table 3 show estimated effects of the structural features of labor relations from equations that omit the non-structural features. We will see later that the results reported in this section change when conflict and culture are included in the model.

Union representation. We find that union representation is positively associated with wages ($p < 0.001$) (column 1a). Union representation is also positively associated with aircraft productivity ($p < 0.001$) and operating margins ($p < 0.05$) (columns 3a and 5a). Union representation is not significantly associated—either positively or negatively—with service failure or labor productivity (columns 2a and 4a). These findings suggest that union representation produces higher wages for workers, and that it provides enough productivity improvement to offset the costs of these higher wages.

Shared governance. Shared governance is associated with reduced service failure ($p < 0.001$) and increased labor productivity ($p < 0.001$), though not with aircraft pro-

Table 2. Correlation Table.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. Union Representation	—											
2. Shared Governance	.30***	—										
3. Conflict	.04	–.02	—									
4. Workplace Culture	–.04	–.22***	–.09*	—								
5. Wages	.08+	–.01	.06	–.03	—							
6. Service Failure	–.02	.04	.12**	–.29***	.11*	—						
7. Aircraft Productivity	–.05	–.18***	–.16***	.33***	–.47***	–.26***	—					
8. Labor Productivity	.08+	.01	–.11*	.33***	–.25***	–.21***	.58***	—				
9. Operating Margin	.11*	.06	–.16***	.22***	–.11*	–.26***	.45***	.43***	—			
10. Capital Intensity	.35***	.37***	.07	–.13**	.20***	–.02	–.19***	.06	.30***	—		
11. Leg Length	–.15***	.25***	.05	–.38***	.05	.25***	–.13**	–.24***	–.01	.40***	—	
12. Aircraft Size	–.37***	.13**	–.04	–.11*	–.02	.07	.10*	–.05	.14**	.34***	.67***	—
13. Employment Growth	–.04	–.08+	–.04	.05	–.07	.07	.16***	.09*	–.01	–.22***	–.31***	–.20***

+Statistically significant at the .10 level; *at the .05 level; **at the .01 level; ***at the .001 level.

ductivity (columns 2a–4a). Shared governance is also associated with lower wages ($p < 0.001$) (column 1a). This is consistent with the fact that shared governance is often offered as a *quid pro quo* for wage reductions that are seen as necessary for the firm's survival. Despite its positive effects on service quality and productivity and its negative impact on wages, however, shared governance does not appear to increase operating margins (column 5a). In our fixed effects model, we found that shared governance was positively associated with operating margins, suggesting that shared governance does increase operating margins within a given airline, but not relative to airlines that have not implemented shared governance.

Wages. Wages are significantly associated with reduced service failure ($p < 0.001$) (column 2a). Wages are also significantly associated with increased labor productivity ($p < 0.001$), though not with aircraft productivity (columns 3a and 4a). The net impact of wages on profitability is neutral, suggesting that the quality and productivity gains associated with higher wages help to offset the costs of wages to the firm (column 5a).

Summary. Taken together, these results suggest that workers can gain from union representation and high wages without imposing costs on firms, due to positive effects on quality and productivity. The evidence also suggests that shared governance increases quality and productivity, though it reduces wages for workers. However, these results come from a model that we believe is under-specified. We have considered only the performance effects of the structural features of labor relations, without accounting for the quality of labor relations. As we see below, our results change in important ways once we account for the quality of labor relations.

The Quality of Labor Relations

Here we discuss the effects of augmenting the structural variables discussed above with what are necessarily rather rough proxy measures for the quality of the labor-man-

Table 3. Labor Relations, Wage Outcomes, and Firm Performance.[a]

	Wage Outcomes (log)		*Service Failure*		*Aircraft Productivity*		*Labor Productivity*		*Operating Margins*	
	1a	*1b*	*2a*	*2b*	*3a*	*3b*	*4a*	*4b*	*5a*	*5b*
Labor Relations										
Union Representation	.18*** (.03)	.06** (.02)	–.05 (.30)	–.11 (.22)	1.15*** (.40)	.70*** (.15)	–.29 (.21)	.11 (.13)	.07* (.03)	.02* (.01)
Shared Governance	–.03** (.01)	–.03** (.01)	–.47*** (.08)	–.40*** (.08)	.15 (.10)	–.53*** (.09)	.22*** (.05)	–.07 (.08)	.01 (.01)	–.02** (.01)
Wages (log)			–2.74*** (.45)	–2.08*** (.47)	.54 (.52)	–3.55*** (.38)	2.76*** (.25)	–1.30*** (.33)	–.00 (.05)	–.14*** (.03)
Conflict		–.00 (.01)		.25* (.10)		–.46** (.15)		–.21 (.13)		–.07*** (.01)
Workplace Culture		.07*** (.01)		–.22* (.09)		.54*** (.08)		.35*** (.07)		.03*** (.01)
Capital Int. (000,000)	.56*** (.06)	.68*** (.06)	4.91*** (.62)	4.25*** (.64)	–5.71*** (.71)	–2.73*** (.69)	.37 (.33)	.98 (.59)	.19* (.08)	.41*** (.06)
Leg Length (000)					1.84*** (.54)	–.78** (.29)	–.02 (.27)	–1.46*** (.26)	–.08 (.05)	–.12*** (.02)
Aircraft Size (00)					2.58*** (.50)	2.09*** (.32)	2.84*** (.24)	.58* (.28)	.13** (.05)	.11*** (.03)
Employment Growth	–.05*** (.01)	–.06*** (.01)								
Chi-square	765.06	841.79	592.70	587.70	357.44	544.89	1045.16	271.88	635.72	786.41
Prob > chi^2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Observations	489	489	489	489	489	489	485	485	489	489

[a]Random effect regressions with firm (n = 10) as the random effect. Regression coefficients and standard errors are shown. Each model includes quarterly dummies to capture changes in the industry environment.

*Statistically significant at the .05 level; **at the .01 level; ***at the .001 level.

agement relationship—conflict and workplace culture (as described above, in the section "Independent Variables"). The effects of adding these variables are shown in columns (1b)–(5b) of Table 3.

Union-management conflict. Union-management conflict is not significantly associated with wages, either positively or negatively (column 1b). However, conflict is associated with increased service failure ($p < 0.05$), reduced aircraft productivity ($p < 0.01$), and reduced operating margins ($p < 0.001$) (columns 2b, 3b, 5b).

Workplace culture. Workplace culture is associated with higher wages ($p < 0.001$) (column 1b). Furthermore, workplace culture is associated with reduced service failure ($p < 0.05$) and with increased aircraft productivity ($p < 0.001$), labor productivity ($p < 0.001$), and operating margins ($p < 0.001$) (columns 2b–5b). In our fixed effects models, where differences between firms were not taken into account, workplace culture was associated with wage gains and aircraft productivity but not with service quality or operating margins, and with lower rather than higher labor productivity. The differences in the fixed effects results suggest that culture change at Continental and Delta had some positive performance effects, but not as comprehensive as the performance effects associated with workplace culture at Southwest.

A Wald test shows that the conflict and workplace culture variables together make a significant contribution to the explanatory power of all our models: wages, aircraft productivity, labor productivity, and operating margins ($p < 0.0001$), as well as service quality ($p = 0.0019$). Thus, while these are only rough measures of conflict and workplace culture, they reinforce the qualitative evidence presented above. Gains from a high-trust workplace culture and a negotiations process that reaches agreements in a timely fashion without reliance

on work disruptions or NMB procedures appear to accrue both to firms and to their employees.

Changed effects of structural elements. Once the quality of labor relations—conflict and workplace culture—is included in the model, the effects of our structural elements change in some interesting ways. Union representation continues to have a positive effect on wages ($p < 0.001$), aircraft productivity ($p < 0.001$), and operating margins ($p < 0.05$) (columns 1b, 3b, 5b), again suggesting that union representation need not come at the expense of firm performance.

But although shared governance continues to be associated with reduced service failure ($p < 0.001$), its positive effects on labor productivity now turn negative, while its neutral effects on aircraft productivity and operating margins now appear to be significantly negative ($p < 0.001$). These results suggest that once we take account of the nature of the underlying relationship, shared governance itself has a net negative impact on profitability.[5] In our fixed effects models, shared governance continued to show positive effects on aircraft and labor productivity, with neutral effects on operating margins, suggesting that shared governance has improved some results for individual carriers, but not relative to other carriers that have not adopted shared governance.

Similarly, once we account for conflict and workplace culture, wages no longer have consistently positive effects. Wages remain significantly associated with increased service quality. But the neutral effects of wages on aircraft productivity now appear to be negative, while the positive effects of wages on labor productivity also become negative. In addition, the net effects of wages on profitability become negative, suggesting that wage gains can come at the expense of profitability if they are not associated with sufficient reduction in conflict and improvements in workplace culture to counterbalance their costs. Our fixed effects models do not show these negative results of higher wages, and indeed show positive effects on labor productivity, suggesting that increasing wages can improve some results for individual carriers relative to their previous results, but not relative to other carriers that are on a lower wage trajectory.

Implications for Labor Relations and Performance

The results presented in this paper indicate that employee gains in labor relations do not necessarily lead to firm losses in the airline industry. In fact, firm performance seems to improve on certain dimensions in the presence of unions. Specifically, as expected, union representation levels are associated with higher wages. But union representation is also associated with higher aircraft productivity, presumably due to higher levels of cooperation and discretionary effort that enable aircraft to be turned around more quickly at the gate and to be otherwise more efficiently used. This productivity enhancement is apparently enough to offset the wage premium, given that union representation is associated with increased rather than reduced profitability.

Shared governance is associated with gains in service quality, aircraft and labor productivity, and operating margins; however, once we control for relationship quality, the positive associations disappear or even turn negative. Furthermore, shared governance is associated with lower, rather than higher, wages. Wages themselves are associated with reduced service failure and increased labor productivity; however, once we control for relationship quality, the association between wages and productivity, as well as wages and operating margins, becomes significantly negative.

[5]One could argue that shared governance reduces labor conflict and improves workplace culture, and in this way contributes to firm performance. However, this argument is not supported by the quantitative data; furthermore, our historical analysis suggested that shared governance by itself cannot be relied upon to reduce labor conflict and improve workplace culture.

Thus, it appears that efforts to avoid unions are not likely to produce a sustained improvement in either service quality or airline financial performance. While shared governance arrangements do produce wage relief and service quality improvements, by themselves they appear to have no other beneficial effects on firm performance. Lower wages are associated with higher productivity and operating margins; however, if those wage reductions are accompanied by increased conflict and a deterioration of workplace culture, they are likely to cause deterioration in every aspect of firm performance measured in this study.

We conclude that while the structural features of labor relations offer little guidance for how to improve performance in the airline industry, the results of our analysis of the underlying quality of the labor-management relationship are more instructive. Both the profiles of the different carriers (especially Southwest, Delta prior to 1994, and Continental after 1994) and the variables that capture the effects of conflict and workplace culture demonstrate the importance of these factors. Thus, efforts to build an effective labor relations system by focusing on the quality of the relationships among employees, supervisors, and managers, and on reaching collective bargaining agreements in a timely and peaceful fashion without resort to extensive use of the NMB procedures, appear to offer considerable potential for improving firm financial performance and the industry's overall service quality.

Implications for Industry Recovery

The airline industry experienced a major shock from the terrorist attacks of September 11, 2001. Revenues dropped by nearly 20% in the months after the attacks, and a year later they remained approximately 12% below their pre-attack level. Employment levels have also been reduced by nearly 15%. Overall, the industry lost approximately $8 billion in 2001, with substantial losses continuing since then. Given both the magnitude of these shocks and the deteriorating conditions before September 11, many major airlines are confronted with the need to implement radical restructuring not just to return to viability and profitability, but even to survive.

Unfortunately, actions taken by airlines since September 11, 2001 indicate that most airlines are once again focused more on cost reduction than on relationship-improving strategies. As noted above, most major carriers announced 15–20% layoffs almost immediately after the attacks. Moreover, several carriers, including American Airlines, Delta, Northwest, United, and US Airways, invoked the *force majeure* clauses in their contracts as a way of avoiding employee termination costs associated with the layoffs (Barakat 2001; *CNNfn* 2001; Greenhouse 2001). And, reminiscent of Continental in 1983, US Airways' and United's bankruptcy filings, and threats by American to follow suit, have been hailed in the business press as a way to gain more bargaining power in negotiations with the unions over wage concessions (Carey 2002; Peltz 2002).

But not all airlines have acted in this manner. Alaska and Southwest, in fact, avoided any layoffs in the 9/11 aftermath (*Wall Street Journal* 2001; Conlin 2001). While this may have been an option that some of the larger, network carriers did not have, there were also ways to address the cutbacks that might be expected to build, rather than erode, the labor-management relationship. Efforts to engage the unions in constructing joint recovery plans and programs that sought voluntary retirements before resorting to forced layoffs, as at Delta (Bachman 2001), are likely to give these carriers an advantage not only in their recovery efforts but even more noticeably in their post-recovery futures.

There is a general consensus among financial analysts that the industry is experiencing a long-term increase in price elasticity that will no longer support current wage levels. This is especially true for the major hub and spoke carriers studied in this paper. Thus, as of this writing, many of these carriers are seeking significant labor cost concessions from their unions and their nonunion employees and managers. It

appears, therefore, that the overall wage structure in the industry may be lowered. Our analysis indicates that wage or employment cuts or efforts to reduce union power or representation alone may produce short-term gains for the firms. But if this is all the firms do, or if it is done in a way that further reduces trust, the short-term gains may very well come at the expense of long-term recovery and health. Our results suggest that actions and policies that help build better labor-management relationships would make significant contributions to the long-run health of both individual carriers and the industry as a whole, even if the short-term pressures make such actions and policies difficult.

Our findings suggest a number of constructive steps union leaders could take as well. To the extent that unions negotiate equity stakes in exchange for wage concessions, the lessons of the past shared governance experiences should be heeded. Any new shared governance arrangements should be combined with agreements on clear, explicit programs and principles to improve the union-management bargaining process and to foster better relationships in the workplace. Union-management initiatives to speed up the process of reaching labor agreements and avoid resort to work or service disruptions or NMB procedures are more likely to pay off if they are built on a basis of trust established during the term of the agreement.

Finally, suggestions can be made for government entities that are currently or may soon be involved in the industry's restructuring (for example, the Air Transportation Stabilization Board [ATSB], bankruptcy courts, Congress, and the White House). For example, the federal government responded quickly to the industry's request for emergency cash relief and authorized the ATSB to provide loan guarantees to firms willing to meet certain requirements. Making government assistance contingent on explicit business plans that include commitments for cost savings is a laudable idea. However, in light of our findings, it seems misguided to focus solely on wage cuts as the critical element of these business plans. This will likely perpetuate the industry's relationship problems, channeling firms into more short-term wage gains at the expense of long-term relationship building. Instead, the ATSB should be requiring not only credible plans for cost reduction and revenue improvement but also credible, actionable plans for programs and policies aimed at improving labor relations and the negotiations process. The same commitment should be required as part of any proposals for new shared governance arrangements as *quid pro quos* for wage reductions.

The airline industry's labor relations system was experiencing major strains before the attacks of September 11. The massive shock of those attacks confronts the industry with the need for major restructuring. This restructuring could possibly worsen the long-run quality of labor relations, and some actions seem to be taking us down that path already. But the restructuring could also be used as an opportunity to build stronger relationships and achieve mutual gains by those firms, unions, and public agencies that seek to learn the lessons of the industry's past.

REFERENCES

Air Travel Consumer Report (ATCR). 1982–2001. Monthly consumer complaints reports.

Airline Industrial Relations Conference (AIRCon). 1984–2001. *Review of Collective Bargaining.* Monthly bulletins from January 1984 through June 2001.

____. 2000. *Strikes under the Railway Labor Act, 1946–1998.*

Bachman, Justin. 2001. "Delta announces fewer layoffs than predicted due to early retirement." *Associated Press Newswire,* October 31.

Barakat, Matthew. 2001. "US Airways Loses $766 Million in Third Quarter, Worse Than Analysts Expected." *Arlington Journal,* October 31.

Blasi, Joseph, and James Gasaway. 1995. "The Great Experiment: Labor-Management Cooperation at Eastern Airlines." In Peter Cappelli, ed., *Airline Labor Relations in the Global Era.* Ithaca, N.Y.: ILR Press (an imprint of Cornell University Press).

Blasi, Joseph, and Douglas Kruse. 1991. *The New Owners.* Champaign, Ill.: Harper Business.

Brooker, Katrina. 2001. "The Chairman of the Board Looks Back." *Fortune,* May 28.

Card, David. 1998. "Deregulation and Labor Earnings in the Airline Industry." In James Peoples, ed., *Regulatory Reform and Labor Markets.* Norwell, Mass.: Kluwer Academic.

Carey, Susan. 2001. "Independent Mechanics Union AMFA Seeks to Represent United Air Employees." *Wall Street Journal,* April 2, p. B8.

____. 2002. "UAL Warns of Bankruptcy Filing." *Wall Street Journal,* August 15, p. A3.

CNNfn. 2001. "Airlines Weigh Severance." September 26.

Cohen, Hirsch. 1998. "Studying Industries and People." *Perspectives on Work,* Vol. 2, No. 1, pp. 13–17.

Conlin, Michelle. 2001. "Where Layoffs Are a Last Resort." *Business Week,* October 8.

Continental Airlines. 2001. http://www.continental.com, accessed August 2001.

Cremieux, Pierre-Yves. 1996. "The Effect of Deregulation on Employee Earnings: Pilots, Flight Attendants, and Mechanics, 1959–1992." *Industrial and Labor Relations Review,* Vol. 49, No. 2 (January), pp. 223–42.

Financial Times. 1982. December 16, Sec. 1, p. 1.

Freeman, Richard, and James Medoff. 1984. *What Do Unions Do?* New York: Free Press.

Gittell, Jody Hoffer. 2000. "Organizing Work to Support Relational Coordination." *International Journal of Human Resource Management,* Vol. 11, No. 3 (September), pp. 517–34.

____. 2001. "Supervisory Span, Relational Coordination, and Flight Departure Performance: Reassessing Post-Bureaucracy Theory." *Organization Science,* Vol. 12, No. 4, pp. 467–82.

____. 2003. *The Southwest Airlines Way: Using the Power of Relationships to Achieve High Performance.* New York: McGraw-Hill.

Greenhouse, Steven. 2000. "Unions at Airlines Assail Management for Denying Benefits." *New York Times,* September 26.

Hammer, Tove, and Robert N. Stern. 1986. "A Yo-Yo Model of Union-Management Cooperation." *Industrial and Labor Relations Review,* Vol. 39, No. 3 (April), pp. 337–49.

Hausman, J. A. 1978 "Specification Tests in Econometrics." *Econometrica,* Vol. 46, No. 6 (November), pp. 1251–71.

Heskett, James L., W. Earl Sasser, and Leonard A. Schlesinger. 1997. *The Service Profit Chain: How Leading Companies Link Profit and Growth to Loyalty, Satisfaction, and Value.* New York: Free Press.

Hirsch, Barry T., and David A. Macpherson. 2000. "Earnings, Rents, and Competition in the Airline Labor Market." *Journal of Labor Economics,* Vol. 18, No. 1 (January), pp. 125–55.

Ichniowski, Casey, Thomas A. Kochan, David Levine, Craig Olson, and George Strauss. 1996. "What Works at Work: Overview and Assessment." *Industrial Relations,* Vol. 25, No. 3 (Fall), pp. 356–74.

Ichniowski, Casey, Kathryn Shaw, and Giovanni Prenushi. 1996. "The Effects of Human Resource Management Practices on Productivity: A Study of Steel Finishing Lines." *American Economic Review,* Vol. 87, No. 3 (June), pp. 291–313.

Johnson, Nancy Brown. 2001. "Airlines." Working Paper, Gatton College of Business & Economics, University of Kentucky.

Knez, Marc, and Duncan Simester. 2001. "Firm-Wide Incentives and Mutual Monitoring at Continental Airlines." *Journal of Labor Economics,* Vol. 19, No. 4 (October), pp. 743–72.

Kochan, Thomas A. 1980. *Collective Bargaining and Industrial Relations.* Homewood, Ill.: Richard D. Irwin.

____. 1999. "Rebuilding the Social Contract at Work: Lessons from Leading Cases." Working Paper #WP09, Task Force on Reconstructing America's Labor Market Institutions, MIT/Sloan School of Management.

Kochan, Thomas A., Harry C. Katz, and Robert B. McKersie. 1986. *The Transformation of U.S. Industrial Relations.* New York: Basic Books.

Levine, David, and Laura D'Andrea Tyson. 1990. "Participation, Productivity, and the Firm's Environment." In Alan S. Blinder, ed., *Paying for Productivity.* Washington, D.C.: Brookings Institution, pp. 183–237.

Loveman, Gary W. 1998. "Employee Satisfaction, Customer Loyalty, and Financial Performance: An Empirical Examination of the Service Profit Chain in Retail Banking." *Journal of Service Research,* Vol. 1, No. 1, pp. 18–31.

McCartney, Scott. 1998. "Continental Air and Pilots Agree on Contract Issues." *Wall Street Journal,* February 26, p. A6.

National Mediation Board. 2000. "Rejections of Tentative Agreements." Internal memo, January 20.

Newsday. 2000. August 28, p. A04.

Oum, Tae Hoon, and Chunyan Yu. 1998. *Winning Airlines: Productivity and Cost Competitiveness of the*

World's Major Airlines. Boston: Kluwer.
Peltz, James F. 2002. "Overhaul May Loom for Airlines." *Los Angeles Times*, August 13, p. 1.
Petzinger, Thomas, Jr. 1996. *Hard Landing*. New York: Random House.
Slichter, Sumner, James J. Healy, and E. R. Livernash. 1960. *The Impact of Collective Bargaining on Management*. Washington, D.C.: Brookings Institution.
Wong, Edward. 2002. "Bankruptcy Hint by United Airlines." *New York Times,* August 15, p. A1