

THE EFFECTS OF EMPLOYEE OWNERSHIP ON PRODUCTIVITY AND
FIRM FINANCIAL PERFORMANCE: THE CASE OF THE US COMMERCIAL
AIRLINE INDUSTRY

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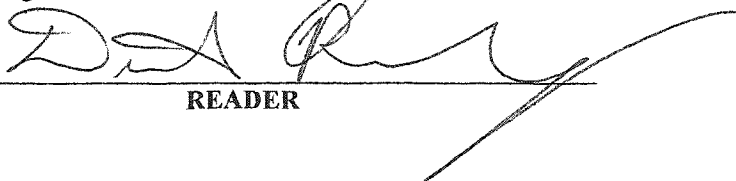
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To my loving family,
for all their support and encouragement.

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Chapter 1

Introduction

The separation of ownership and control has long been a popular topic of research in economics and business. The majority of this research has focused on how corporations might align the interests of owners and managers and by doing this, ultimately reduce agency costs and eliminate the free-rider problem. The result of this, in theory, would be an increase in firm profitability, and more efficient productivity from a highly motivated workforce.

Berle and Means (1932)¹ extensively studied this topic and its implications. The authors wrote of the disalignment between the interests of owners and managers, and how this disalignment may negatively impact firm productivity. They also suggest that managers who have a claim to firm profits may seek to maximize their own personal wealth rather than the wealth of the firm. Jensen and Meckling (1976) suggest that even though this misalignment exists, owners can establish a "nexus of contracts"²

¹ Berle, A.A., and Means, G.C., 1932, The Modern Corporation and Private Property, New York, MacMillan

² Jensen, M.C. & Meckling, W.H., 1976, "Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure" *Journal of Financial Economics*, 3, 305-360

to minimize it. These contracts can be in the form of compensation or incentive packages, which would be directly linked to the financial performance of the firm. Agency costs arise in the form of monitoring these contracts. Fama and Jensen (1983), and Demsetz (1983), all argue that as level of managerial share ownership increases, the share value will decline. This decline will happen as a result of the inefficient use of resources by managers.

One vehicle being used by businesses today to more closely align the interests of owners and managers is employee ownership. Employee ownership can take many forms. Some of the more popular employee ownership mechanisms are:

- Employee Stock Ownership Plans (ESOPs)
- 401K Plans
- Employee Stock Purchase Plans
- Worker Cooperatives

Employee ownership as defined by the National Center for Employee Ownership, is "a plan in which the company's employees own at least some stock in the company even if they can not vote it, and even if they can not sell it until they retire or

leave."³ The most widely used vehicle of employee ownership is the Employee Stock Ownership Plan or ESOP. These plans are often viewed as incentive benefit plans for employees, but they also provide the firm with benefits as well. Advocates of ESOPs maintain that an ownership stake in the company will provide employees and managers with a variety of benefits including:

- the incentive for workers to improve their individual performances as well as the performances of their co-workers,
- the incentive to overcome the free-rider problem through monitoring and peer pressure,
- the alignment of the interests of owners and managers
- an improved flow of information between management and labor within the firm.

The concept of worker ownership is nothing new, and can be traced back to as early as 1776. In The Wealth of Nations, Adam Smith emphasized the division of labor, and made several references to the principal/agent problem, which existed even at that time. Cooperatives have existed within the United States since the 1800's, and remain a strong organizational form today. The labor movements of the early 20th century also contributed to the creation of labor cooperatives. These cooperatives were similar to the ESOPs of today in the sense that it took poor

³ The National Center for Employee Ownership

economic conditions and anticipated financial hardship for management to entertain the idea of employee ownership. This remains one of the major factors effecting the decision to implement an ESOP, even in the 21st century.

Employee ownership in the traditional firm dates back to the early 1900's. At that time, many banking and insurance firms offered stock purchase plans that enabled their employees to purchase company stock at a discounted rate. These managers were also seeking the incentive benefits that they believed ownership stakes would provide their employees.

The ESOPs that we have come to know today, however, are a little different. The traditional stock purchase plan enables employees to purchase their company's stock at a discounted rate exclusive to them. Often the company will match the contribution of the employee. ESOP's are slightly different. In an ESOP, employees never have to make a financial contribution. Today's ESOPs are basically a stock bonus plans: employee benefit plans designed to offer employees benefits in the form of company stock.

An ESOP creates a pension trust that invests primarily in the stock of the company. Companies that sponsor ESOPs are given certain tax benefits, along with the anticipated theoretical

benefits of increased productivity and efficiency by employee owners who want to maximize the value of the stock that they too now own.

While stock purchase plans still exist, an ESOP is a little different. ESOPs have gained popularity within the past 25 years. Louis Kelso is considered to be the forefather of ESOPs. Kelso, an investment banker, felt that the capitalist system would be stronger if everyone, not just the fortunate few, would be able to share the wealth. Kelso felt that employee ownership would grant society a multitude of benefits. Included among these were:

- making workers part of the capitalist system, thereby offering them the opportunity to create personal wealth,
- giving workers a second income; an investment that would grow over time, allowing them to have future savings,
- encouraging greater investment in the firm,
- providing labor with the incentive to work harder, thereby positively influencing productivity and increasing the value of the firm, and

- helping to mitigate "the inflationary bias of full-employment and social welfare policies"⁴

Kelso persuaded Senator Russell Long that ESOPs should be given special tax advantages, which, until that time, were not clearly defined. Kelso hoped that given the tax advantages, more companies would have the incentive to implement them, and the mass wealth of the nation would be spread among the people, especially those who would not normally have the ability to achieve this wealth. In 1974, The Employee Retirement Income Security Act (ERISA) was passed. ERISA gave ESOPs the special tax treatment that Kelso was hoping to obtain. Today, the tax advantages of ESOPs are tremendous. In 1985, there were approximately 7000 firms with ESOPs. Those firms received a tax subsidies estimated at approximately \$2.5 billion. Those subsidies increased to over \$4.4 billion in 1990.

There are many reasons a company would implement an ESOP. Rooney (1986) summarized the main reasons of implementation as:

- as a means of starting-up of a new firm,
- as a way to buy out an existing owner,
- as a mechanism to prevent a takeover,

⁴ Kelso, Louis O., and Adler, Mortimer J., 1958, The Capitalist Manifesto, New York: Random House; The New Capitalists: A Proposal to Free Economic Growth From the Slavery of Savings, 1961, New York, Random House

- as a way to acquire or divest a subsidiary,
- as a less expensive way to borrow money,
- as an attempt to salvage a failing company,
- as a way to avoid going public,
- as a mechanism to refinance existing debt,
- as a way to go private,
- as part of an employee benefits package,
- as an attempt to improve relations between labor and management,
- as a bargaining tool in lieu of wages and other concessions and
- as a participatory management style.⁵

Interest in employee ownership of companies, has grown dramatically within the past quarter century, as have the number of ESOPs. In 1975, there were 1600 employee ownership plans. Today there are over 10,000 ESOPs covering over 8 million employees. Approximately 6000 of these firms have employee ownership plans that are large enough to affect decision making, strategy and corporate culture. Additionally, of these 10,000

⁵ Rooney, Patrick, 1986, " Employee Ownership and Firm Performance", Indiana University, Doctoral dissertation

firms, approximately 2500 are majority owned by the employees, including over 1000 which are completely owned by the ESOP.⁶ Approximately 25% of ESOP firms are within the manufacturing sector. By the end of 2000, the total assets owned by US ESOPs amounted to over \$500 billion. As of 2002, the number of ESOP plans in this country was over 11,000, with 8.8 million participants, and plan values of over \$400 Billion.⁷

Since their inception in the 1970's, the parameters of employee ownership have evolved. Plans have grown to include majority ownership and board membership. The separation of ownership and control, which was once a clear line has now become blurred, or in some instances, completely erased.

The airline industry, in particular, has adopted employee ownership in many ways and in varying degrees. Since the Airline Deregulation Act of 1978, many US airlines have experienced extremely difficult financial times. During these times of economic distress, many airlines have implemented ESOPs in lieu of salary increases or other benefits. Some airlines have adopted ESOPs not only as a benefit, but as a management philosophy as well. United Airlines is the most well known case

⁶ The ESOP Association: Reference library; ESOP Statistics; www.esopassociation.org

⁷ The National Center for Employee Ownership

of employee ownership within the airline industry. In July 1994, United Airlines stockholders overwhelmingly voted for their employee ownership plan. Their historical and high profile plan gave employees majority ownership, with a 55% stake in the company, as well as three seats on the Board of Directors. This ESOP created the largest company in the world with majority ownership. United's goal was to create the most profitable airline in the world by aligning the interests of employees, managers, and public shareholders. In this case, the separation of ownership and control had been completely eliminated.

United was not the only airline to implement employee ownership plans. Southwest Airlines has long had a very active plan, and a corporate culture that emphasized worker participation and an open door management style. Northwest and TWA also sold significant portions of their firms to employees at certain times. Delta and Continental had small ESOPs, and American Airlines recently announced its intent to sell 25% of existing outstanding shares to employees. This was announced as part of a plan to help the struggling carrier through its currently difficult time.

The purpose of this dissertation is to determine if employee ownership plans have positive effects within the UC commercial airline industry. The top ten commercial airlines will

be examined over a ten year period. The unique economics of the airline industry will be discussed. I will examine how employee ownership programs have effected both productivity and firm financial performance. A multitude of variables will be used to measure the effectiveness of these programs. Included among these variables are net profit or loss, ROA, NPM, OPM, revenue, passengers serviced per employee and revenue passenger miles. The time period being studied is 1992 - 2002.

The airline industry has suffered devastating losses as a result of the terrorist attacks of September 11, 2001. In light of this, I will also examine the industry in the pre-9/11 world, to determine if any results were altered due to the magnitude of the events of September 11th, and their significant financial aftermath.

Considering the size and amount of employees within this industry, ESOPs can have a tremendous effect on the wealth of many. The relevance of ESOPs in today's business environment, and the use of them to weather economic storms, makes them an integral part of the business world.

Chapter 2

Literature Review

A significant amount of research has been devoted to the topic of employee ownership. The spectrum has ranged from studying the separation of ownership and control and the principal agent problem, to detailed studies of performance within and about various industries.

Adam Smith, in 1776, wrote of the subject in The Wealth of Nations. Smith wrote:

"The directors of such joint stock companies, however, being managers of other peoples money than of their own, it can not well be expected that they should watch over it with the same anxious vigilance with which the partners in a private co-partnery frequently watch over their own."⁸

The separation of ownership and control was a topic of special interest to Berle and Means.⁹ In their 1932 book, The Modern Corporation and Private Property, Berle and Means noted that because ownership within most public companies is widely

⁸ Smith, Adam, 1776, The Wealth of Nations, Modern Library Edition 1937, The Modern Library, Random House, New York

⁹ Berle, A.A., and Means, G.C., 1932, The Modern Corporation and Private Property, New York, MacMillan

dispersed, not one particular person (or group) owned more than 1% of remaining outstanding stock. Berle and Means felt that those who owned stock in publicly held firms were "passive owners"¹⁰, meaning that they have very little or no say at all in the operation of the firm. The authors also assume that the objective of both owners and managers is the maximization of their personal wealth. With this in mind, if owners lack control, their interests will not be aligned with the interest of the managers, who are also concerned with maximizing their own personal wealth. This misalignment of interests creates problems within the firm.

Jensen and Meckling¹¹ also extensively examined the principal/agent relationship. They acknowledge this divergence of interest between the two parties. The authors feel that principals can limit this divergence through the establishment of incentives for agents. These incentives should be based upon mutually agreed upon conditions. If effective, they would thereby reduce the need for monitoring.

Offering management shares of ownership has been proposed as another means of solving the principal/agent problem. In this

¹⁰ *ibid*

¹¹ Jensen, M. C. and Meckling, W.H., 1983, "Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure", *Journal of Financial Economics*, 3, 305-360

case. Owners and managers would, in theory, have the best interests of the firm at heart. This is based upon the idea that if managers have an ownership stake in the firm, they are less likely to consume non-pecuniary benefits than managers who are non-owners. This "convergence of interests"¹² hypothesis predicts that as managers increase their shares of ownership, the value of the firm will increase as well. Based upon this theory, it is believed that firms controlled by owner/managers will outperform firms that are simply management controlled.

Demsetz (1983)¹³ contributed to this argument. Demsetz contends that if owner/managers can maximize greater wealth from the consumption of non-pecuniary benefits rather than from maximizing the value of the firm, the owner/managers have greater motivation to engage in behavior that is not aimed at maximizing the value of the firm. The "managerial entrenchment hypothesis"¹⁴ predicts that the value of shares will decrease as the level of managerial ownership increases. This result is due to the likelihood that management will use resources inefficiently, and continue to engage in self-serving behaviors.

¹² *ibid*

¹³ Demsetz, Harold, 1983, "The Structure of Ownership and the Theory of the Firm", *Journal of Law and Economics*, 26, 375-390

¹⁴ *ibid*

Ward (1958), Vanek (1970) and Meade (1972) did significant research on the viability of firms that were labor managed (LMFs).¹⁵ Vanek (1970) is probably the most comprehensive of the theories, and the one most studied by other theorists and researchers. The conclusion of these works was that labor managed firms could not survive in a market driven economy because of a unique structure that causes them to decrease in size as a result of an increase in output prices. This anomaly has been called the "perverse supply curve of the LMF"¹⁶

Miyazaki (1983)¹⁷ and Ben-Ner (1987)¹⁸ have both studied the growth and dissolution of the labor managed firm. Miyazaki focuses on the life-cycle of the labor managed firm in the capitalist economy. Miyazaki concluded that most LMFs come into existence as an attempt to revive an economically failing firm. Because of this, Miyazaki concludes that LMF that are "born"¹⁹ during economically distressed times, will only survive in a

¹⁵ Ward, Vanek and Meade use the term labor-managed firm to describe firms that were either cooperatives, employee owned or employee managed. The term labor-managed firm is used interchangeably with the term employee owned firms in this paper.

¹⁶ Vanek, Jaroslav, (1970), The General Theory of Labor Managed Market Economies, Cornell University Press, Ithaca and London

¹⁷ Miyazaki, Hajime, (1984), "On Success and Dissolution of the Labor Managed Firm in The Capitalist Economy", *Journal of Political Economy*, Vol 93, 909-930

¹⁸ Ben-Ner, Avner, (1984), "The Life Cycle of Worker Owned Firms in Market Economies", *Journal of Economic Behavior and Organization*, 287-311

¹⁹ Miyazaki, , Hajime, (1984), "On Success and Dissolution of the Labor Managed Firm in The Capitalist Economy", *Journal of Political Economy*, Vol 93, 909-930

similar situation. As the firm becomes successful, or as economic conditions improve, it will morph back into the traditional profit maximizing firm.

Ben-Ner (1987)²⁰ also studied the birth, evolution and demise of the labor managed firm in a market driven economy. Ben-Ner concluded that worker owned firms face initial difficulties or obstacles, but that these difficulties are capable of being overcome, and the firm can enjoy "sufficiently large efficiency advantages"²¹ Ben-Ner also concludes that LMFs can attain superior efficiency, and that this higher level of efficiency will permit the LMF to survive longer than traditional profit maximizing firms during economically challenging times.

Numerous studies have been done on the topic of productivity and performance within employee owned firms. Thus far, the results have been mixed. Companies with ESOPs have been shown to outperform non-ESOP companies with regard to market value, sales growth, growth of employment, employee retention and accounting based returns. ESOP firms have also been shown to incur lower workers compensation costs.

²⁰ Ben-Ner, Avner, (1984), "The Life Cycle of Worker Owned Firms in Market Economies", *Journal of Economic Behavior and Organization*, 287-311

²¹ *ibid*

While many studies show a positive relationship, the relationship has not always been statistically significant. Depending on the methods utilized and industry studied, some researchers have concluded that employee owned firms fare no better or worse than their traditional counterparts.

Bellas (1972)²² conducted a study of 21 cooperatives in the plywood industry. Of the 21 firms asked to participate in the survey, 15 provided sufficient data to be included in the study. Bellas found these firms to be more productive, than the traditionally owned firm. The author also noted that a higher level of performance was associated with higher levels of employee participation.

Dahl (1957)²³ also did research on cooperatives. Dahl studied companies that were traditional profit maximizing firms which had been converted, for various reasons, into cooperatives. His results showed that productivity was 20-50% higher in the cooperative form than it was in the traditional form.

²² Bellas, Carl J., 1972, "Industrial Democracy in the Worker Owned Firm: A Study of 21 Plywood Companies in the Pacific Northwest", New York, NY, Praeger

²³ Dahl, Robert, 1957, A Preface to Democratic Theory, University of Chicago Press, Chicago, IL

Conte and Tannenbaum (1978)²⁴ conducted a study of 30 ESOP firms. Conte and Tannenbaum found that these firms exceeded their industry average in pretax returns on sales. These results, however, were not significant. They did, however, find a statistically significant relationship between the percentage of equity employees owned, and the productivity of the firm.

One of the largest studies conducted was done by Marsh and McAllister (1981)²⁵. The authors surveyed 1400 firms that were interested in implementing ESOPs during the years 1975-1976. Of the 1400 firms, 229 actually implemented the program. Of the companies that implemented the ESOPs, one third stated that the quality of work was improved. Similar results were found with regard to levels of turnover. A smaller percentage found improvement in the areas of lateness, absenteeism, and employee grievances. Although the results were mostly positive, surprisingly, approximately 5% of the firms experienced a higher level of employee turnover, and approximately 1% reported a decline in work quality. Overall the majority of the companies surveyed felt that the ESOP had a positive influence in the workplace.

²⁴ Conte, M.A. & Tannenbaum, A.S., 1978, "Employee Owned Companies: Is the Difference Measurable?" Monthly Labor Review, 101 (7), 23-28

²⁵ Marsh, T. & McAllister, D., 1981 "ESOPs Tables", Journal of Corporation Law, Vol. 6, No. 3, Spring 1981, 552-620

Rosen and Klein (1983)²⁶ studied the relationship between ESOPs and employment growth. The authors studied employment growth during the period 1972-1982. They discovered that in firms of 10 or more employees, ESOP firms had employment growth that was 2.78% greater annually than their traditional counterparts.

The threat of hostile takeover is one reason for the implementation of ESOPs; therefore a significant amount of research has been done with regards to employee ownership and takeovers. Beatty (1995)²⁷ studied tax and corporate control effects of employee ownership by measuring the stock markets reaction to the announcement of the ESOPs implementation. Her results show that investors in ESOP companies anticipate higher returns based on tax savings and the reduced threat of takeover that the ESOP provides, thereby indicating a positive perception by investors to ESOP firms.

Scholes and Wolfson (1990)²⁸ conducted research relative to the takeover issue as well. The authors noted that in large firms, the anti-takeover benefits provided by the ESOP were the primary motive for its implementation. Tax incentives and

²⁶ Rosen, C. & Klein, K., 1983, "Job Generating Performance of Employee Owner Companies", Monthly Labor Review, 106, No. 8, August 1983, 15-19

²⁷ Beatty, A., 1995, "The Cash Flow and Informal Effects of ESOPs", Journal of Financial Economics, 38, 211-240

²⁸ Scholes, M. & Wolfson, M., 1990, "Employee Stock Ownership Plans and Corporate Restructuring: Myths and Realities", Financial Management" 19, 12-28

employee motivation were not the primary reason for ESOP implementation according to their study.

Gordon and Pound (1990)²⁹ continued with research along these lines. The authors studied how ESOPs affect shareholder wealth in the face of a possible takeover threat. Several interesting results are noted. First, plans that were established during the takeover threat reduced the shares value by 4%. Additionally, the value of shares also decreased if the ESOP was designed to take control away from outside shareholders. On the contrary, plans that were established with non-voting stock resulted in a significant increase in the value of the shares..

The National Center for Employee Ownership (NCEO) has done several relevant studies. During 1983-1984, they conducted three studies which found very positive effects of employee ownership on the firm. In 1984, Ira Wagner³⁰ examined 13 publicly traded companies that had a minimum of 10% employee ownership. Wagner found that these firms outperformed 62-75% of their competitors. Regardless of higher performance, the stock prices of these firms followed industry norms.

²⁹ Gordon, L. & Pound, J., 1990, "Employee Stock Ownership Plans and Corporate Control", *Journal of Financial Economics*, 27, 525-555

³⁰ Wagner, Ira, 1984, Report to the NYSE on Performance of Publicly Traded Companies with Employee Ownership Plans: National Center for Employee Ownership

In another NCEO study, Trachman³¹ studied 7500 computer and electronics firms. His research found a very strong, positive correlation between both sales and employment growth relative to the percentage of the firm that was employee owned. Specifically, he found that firms offering ESOP participation to over half of their employees had significantly larger sales and employment growth than non-ESOP firms, at two and four times respectively.

Bloom (1985)³² provided a very comprehensive examination of employee ownership in public firms. His study revealed no significant relationship between employee ownership and firm performance.

Quarrey (1986)³³ conducted the first study focusing on productivity that used before and after data. Quarrey used this data, and then compared the results to a matched sample of non-ESOP firms. Quarrey's results indicated the following: in the period following the implementation of the ESOP, employee owned firms experienced 6.5% faster growth in employment. These firms also had a 7.1% faster rate of growth in sales than their traditional counterparts. This result was highly significant.

³¹ National Center for Employee Ownership Study, 1985

³² Bloom, S., 1985, Employee Ownership and Financial Performance, PhD Dissertation, Harvard University, Cambridge, MA

³³ National Center for Employee Ownership Study, 1986

Conte (1992)³⁴ , Rosen (1990)³⁵, the US General Accounting Office (GAO) (1986, 1987)³⁶ conducted several large studies and all conclude that ESOPs have no significant effect on firm performance unless a high level of participation by management is involved. These studies use several measure of performance (ROE, ROA, productivity, growth, undistributed cash flow, and operating income) to compare pre-adoption and post-adoption performances in firms with employee ownership plans. The GAO study found that ESOPs had no impact on profits, but that ESOP firms with a highly participatory, hands-on management style increased their productivity rate by 52% per year.

Management style and employee perceptions of ownership have also been studied. Winther (1999)³⁷ studied employee's perceptions of employee ownership and how they view themselves in this process. What the author concluded was that most employee owners do not see themselves as owners, nor do they see their position within the firm gain any additional importance.

³⁴ Conte, M., 1992, "Contingent Compensation: Does it Affect Company Performance?", *Journal of Economic Issues*, 26, No. 2, 583-592

³⁵ Rosen, C., 1990, "The Record of Employee Ownership", *Financial Management*, 19, No. 1, 39-47

³⁶ US General Accounting Office Report, 1986, "Employee Ownership and Productivity", Washington DC

³⁷ Winther, Gorm, and Marens, Richard, 1997, "Participatory Democracy May Go a Long Way: Comparative Growth Performances of Employee Ownership Firms in New York and Washington States", *Economic and Industrial Democracy*, Vol. 18, 393-422

Rosen and Young (1993)³⁸ also address management style. In what has been named Theory O, the authors stress the importance of an ownership style of management that includes high levels of participation by upper management. Upon studying the success of employee owned firms, the authors noted, that while growth of all the firms studied was high, the largest amount of this growth was by companies with highly participatory management styles. Creating an ownership style of management appeared to make a tremendous difference in the growth of these ESOP firms. Most of the highly participatory firms grew at a rate of 11-17% faster than their less participatory counterparts. Ownership and participation combined will be more effective than either will be alone.

Blasi (1988)³⁹ provided an extensive examination of employee ownership in his book Employee Ownership: Revolution or Rip-off? Blasi studied all aspects of ESOPs including their implementation, capital formation and corporate finance, economic performance and the labor/management relationship. Blasi recommends that ESOPs can be utilized better in the workplace, to

³⁸ Rosen, C., & Young, K., 1993, Understanding Employee Ownership, Cornell University Press, Ithaca, New York

³⁹ Blasi, J., 1986, Employee Ownership: Revolution or Rip-Off?, New York, Harper Business

help foster and promote competition, motivate employees and create a more favorable workplace and working environment

Kruse and Bell (1995)⁴⁰ found positive but statistically insignificant effects of employee ownership on productivity and profitability. Additional studies (Beatty 1995⁴¹, Cahuc and Dormont 1997⁴²) also show similar results.

In the 1998 NCEO study, "Wealth and Income Consequences of Employee Ownership", Kardas, Keogh and Scharf⁴³ found that employees are better compensated in ESOP firms than in non-ESOP firms. They found median hourly wages to be 5-12% higher than non-employee owned firms. Additionally, they found average retirement benefits to be \$32,213, as opposed to \$12,735 for non-ESOP firms.

In 2000, one of the largest study to date was done by Kruse and Blasi⁴⁴ of Rutgers University. They found that ESOPs increase

⁴⁰ Kruse, D. & Bell, L, 1995, "ESOPs, Profit Sharing and Gainsharing in Airlines and High Technology Industries", Report to the US Department of Labor

⁴¹ Beatty, A., (1995) The Cash Flow and Informal Effects of ESOPs", Journal of Financial Economics, 38, 211-240

⁴² Cahuc, P., and Dormont, B., (1997) "Does Profit Sharing Increase Productivity and Employment? A Theoretical Model and Empirical Evidence on French Micro Data", Labor Economics, 4, 293-319

⁴³ The National Center for Employee Ownership Study, 1998

⁴⁴ Kruse, D., Blasi, J., Sesil, J., Kroumova, M., and Carberry, E., 2000, "Stock Options, Corporate Performance, and Organizational Change", Oakland, CA, The National Center for Employee Ownership

sales, employment, and sales per employee by 2.4% a year more than the traditionally owned firm. They also concluded that employee owned firms are more likely to remain in business than their traditional counterparts.

A substantial amount of research has been dedicated to the use of employee ownership as a means of privatization in transition economies. Russia, China and much of the Eastern European countries have all adopted employee ownership for this purpose.

No study to date has focused on employee ownership within the airline industry as a whole. United has been closely watched since the inception of its highly publicized ESOP in 1994. Views of Uniteds ESOP have been mixed. Initially, the ESOP seems to help United grow and prosper. Between 1994 and 1997, the value of the company's stock tripled, trading at \$100.00 per share. But between April 1999 and March 2000, stock prices plunged over 45%. United Airlines filed for bankruptcy in December 2002. Some industry analysts feel that the ESOP was a contributing factor in Uniteds downfall, as were the terrorist attacks of 9/11 and the threat of war with Iraq. Southwest, another major player in employee ownership, fared well in the wake of 9/11. In this case, their ESOP was actually credited with the company's success.

Chapter 3

Theory

Many theories, including both classical and institutional, have both contributed to the current theories on employee ownership. Classical theory has traditionally shown the firm as a "black box" into which the inputs of capital and labor are placed to generate outputs. Institutional theory begins its analysis by asking the question "Why do firms exist?"⁴⁵, and under what set of circumstances will they be most efficient? This chapter will examine both institutional and classical theories, as well as theories unique to employee owned firms.

While mention of the topic can be traced back to Adam Smith, the primary initiation of theoretical discussion can be credited to Berle and Means. In their book, The Modern Corporation and Private Property⁴⁶, the authors addressed the issues of the separation of ownership and control. As eluded to, they authors note that when the interests of both parties (owners and managers), are not aligned, the productivity and production that results is not maximized. The firm suffers as a result.

⁴⁵ Coase, Ronald, 1937, " The Nature of the Firm", *Economica*, Vol. 4, 386-405

⁴⁶ Berle, A.A., and Means, G.C., 1932, The Modern Corporation and Private Property, New York, MacMillan

Ronald Coase (1937) in his article "The Nature of the Firm"⁴⁷ attempts to make the black box theory more contemporary. Coase first posed the question "Why do firms exist?" and said that "our task is to attempt to discover why a firm emerges at all in a specialized exchange economy."⁴⁸ Coase maintains that the firm exists to reduce the number of contracts that exist to one, therefore greatly reducing transactions costs. This assertion raises the question that, if the existence of the firm is to reduce transactions costs, "why isn't all production carried out by one firm?"⁴⁹ Coase's response to this is that diminishing returns to management exist, and therefore when a firm reaches a certain size, it becomes hard to manage. At that point, the resources of the firm could be utilized more efficiently elsewhere.

Alchian and Demsetz (1972) expand upon the work of Coase. Alchian and Demsetz equate the firm to a team production. They assert that firms are "organizational forms characterized by the team use of inputs plus the centralized position of some party in contractual arrangements of all other inputs."⁵⁰ The firm only exists, according to Alchian and Demsetz, when production by a

⁴⁷ Coase, Ronald, 1937, "The Nature of the Firm", *Economics*, Vol. 4, 386-405

⁴⁸ *ibid*

⁴⁹ *ibid*

⁵⁰ Alchian, Armen, and Demsetz, Harold, 1972, "Production, Information Costs and Economic Organization", *American Economic Review*, Vol. 62, 777-795

group or team is more profitable or efficient than that of an individual. In these types of situations, it becomes more difficult to determine each individual's level of productivity. As a result, this can lead to "shirking"⁵¹ by individuals looking to maximize their overall utility. And personal wealth.

Alchian and Demsetz suggest that it is necessary for a monitor to exist in order to reduce the shirking of other group members. This concept is similar to the nexus of contracts posed by Jensen and Meckling. "The monitor earns his residual through the reduction in shirking that he brings about, but also by observing and directing the actions or uses of these inputs."⁵²

Alchian and Demsetz also make several implications about profit sharing. They state:

"An implicit auxiliary assumption of our explanation of the firm is that the cost of team production is increased if the residual claim is not held entirely by the central monitor."⁵³

This implies that when profit sharing is introduced as an

⁵¹ Alchian, Armen, and Demsetz, Harold, 1972, "Production, Information Costs and Economic Organization", American Economic Review, Vol. 62, 777-795

⁵² *ibid*

⁵³ *ibid*

incentive, the monitors' incentives are reduced. IN fact, the monitor's incentives are reduced to the point that their reduction is greater than the anticipated positive effects of the profit sharing plan upon the employees. As a result, this would increase total costs. The authors do believe however that profit sharing has its advantages. They feel that these advantages are most apparent in small firms where self management would be present. They conclude that these types of arrangements allow for "more effective reciprocal monitoring among inputs."⁵⁴

Adding to the theory of Alchian and Demsetz, Cable and Fitzroy (1980)⁵⁵ claim that participatory firms are able to produce more positive outcomes than the traditional profit maximizing firm. According to the authors, "when decisions are in some sense taken jointly, they are more likely to be regarded as fair"⁵⁶ When jointly accepted, these decisions are more likely to be embraced and implemented by employees.

Fama and Jensen (1983)⁵⁷, assert that written and unwritten contracts exist within an organization. These contracts serve the

⁵⁴ Alchian, Armen, and Demsetz, Harold, 1972, "Production, Information Costs and Economic Organization", *American Economic Review*, Vol. 62, 777-795

⁵⁵ Cable, John and Fitzroy, Felix, 1980, "Cooperation and Productivity: Some evidence from the West Germany Experience", The Political Economy of Cooperation and Participation, Oxford University Press

⁵⁶ *ibid*

⁵⁷ Fama, Eugene, and Jensen, Michael, 1983, "The Separation of Ownership and Control", *Journal of Law and Economics*, Vol. 26

following purposes. First, they should clearly state the steps involved in the company's decision making process. Secondly, they should define who the residual claimants are. Lastly, these contracts should set up mechanisms for controlling the agency problem. The authors also discuss the difference between decision management and decision control. Decision management involves initiation and implementation, while decision control involves ratification and monitoring. The authors conclude that "separation of residual risk bearing from decision management leads to decision systems that separate decision management from decision control."⁵⁸

Formal theories that were specific to employee owned firms began to emerge with Ward (1958)⁵⁹ and Vanek (1970)⁶⁰, and have since been reworked and enhanced (Meade 1972, 1974; Vanek 1975, 1977; Miyazaki 1983; Ben-Ner 1984). The primary conclusion of these articles was that labor managed firms could not survive in a market driven economy due to a structural uniqueness coined "the perverse supply curve of the LMF."⁶¹

⁵⁸ *ibid*

⁵⁹ Ward, Benjamin, 1958, "The Firm in Illyria: Market Syndicalism", *American Economic Review*, 566-589

⁶⁰ Vanek, Jaroslav, 1970, *The General Theory of Labor Managed Market Economies*, Cornell University Press, Ithaca and London

⁶¹ *ibid*

Vanek (1970) is the most comprehensive and regarded as the foundation for other theories of LMFs. Vanek's labor managed economy begins with the following set of assumptions:

- all members of the firm share in the net income of the firm
- labor means everyone
- a full decentralization of decision making exists, and full reliance upon market forces exists regarding the allocation of resources
- members enjoy "usufruct"⁶² of assets
- free mobility of labor exists

Vanek's underlying assumption is that labor managed firms are firms in which labor controls the firm. It is owned and run by the employees and no one else. Based upon this, Vanek attempts to maximize net income per laborer. This can be written as:

$$\text{MAX: } s = \frac{(pX - wL - rK)}{L}$$

L

$$\text{SUBJECT TO: } X=f(K,L)$$

$$\text{By setting } s/L=0 \text{ we get: } \frac{((pXL - w)L - (pX - wL - rK))}{L^2} = 0$$

L^2

$$\text{which can be simplified to: } pX_L = s + w$$

⁶² Vanek, Jaroslav, 1970, The General Theory of Labor Managed Market Economies, Cornell University Press, Ithaca and London

The LMF will therefore choose L^* where $pX_L = y$.

The first order condition becomes: $Y^* = pf(L)$

$$r = pf(K)$$

WHERE: Y^* = net income per member

Y = net income

L = number of members

P = price of goods produced

r = rental rate of capital goods

K = capital

$f(L)$ = MPL

$f(K)$ = MPK

The first order condition indicates that the LMF will maximize surplus per member by setting the dividend equal to the marginal physical product of labor (MPL). Vanek also assumes perfect competition, where firms can hire non-labor inputs at fixed costs per unit. Vanek also assumes that firms also sell their goods at fixed prices. Based upon these assumptions, an LMF can hire additional units of labor whenever the contribution of that new unit is greater than the cost of that unit.

There is something interesting to note. Upon studying the model, one sees that an increase in the price of goods produced increases the MPL. These increase by the same amount. Since fixed

costs are positive in Vanek's model, each member's income will increase by more than the price increase. This results in a scenario that states as P increases, the amount of additional units of labor hired decreases. This anomaly is coined "the perverse supply curve of the LMF".⁶³ The primary difference between the LMF and the capital maximizing firm (KMF) is that LMFs seek to maximize the worker surplus, while KMFs are interested in pure profit maximization.

Because of its very strict set of assumptions, there have been several critiques of this model. Initial responses stated that the model was based upon unrealistic assumptions. Others claimed that the results of the model held true only in the short run (Estrin 1982; Stephen 1982, 1984; and Ireland and Law 1982). Additionally, in this model, Vanek assumed that the LMF adjusts its size/membership in the short run to meet market conditions. This assumption has been questioned. It is asserted that an employee owned firm will not be able to hire/fire members as prices and market conditions change. One alternative proposed was to hire non-owner labor rather than adjust size.

Hiring non-owner labor provides a practical solution, but creates another problem. Now the LMF that hires non-owner labor faces the possibility of turning into the traditional profit

⁶³ Vanek, Jaroslav, 1970, *The General Theory of Labor Managed Market Economies*, Cornell University Press, Ithaca and London

maximizing firm. It also gives rise to several other theories of the labor managed firm.

Such are the theories of Miyazaki (1987)⁶⁴ and Ben-Ner (1984, 1987)⁶⁵. These theorists have studied labor managed firms and have developed what is known as "the life cycle theory" of the labor managed firm.

Initially investigated by Ben-Ner and Miyazaki, life cycle theory follows the birth, growth and death of the labor managed firm. Life cycle theory implies that the conditions surrounding the creation or "birth" of the LMF can be critical to its survival. An LMF that is born during economically distressed times, as many employee owned firms are, can only survive in similar economic conditions. If economic conditions improve, the LMF will turn to hiring non-owner labor. With the addition of this non-owner labor, the LMF will evolve back into the traditional profit maximizing firm.

Miyazaki examined under what conditions a LMF would be formed, could survive and when it would degenerate. This stage is

⁶⁴Miyazaki, Hajime, 1984, "On Success and Dissolution of the Labor Managed Firm in The Capitalist Economy", *Journal of Political Economy*, Vol 93, 909-930

⁶⁵ Ben-Ner, Avner, 1984, "The Life Cycle of Worker Owned Firms in Market Economies", *Journal of Economic Behavior and Organization*, 287-311

called the birth stage of the LMF. Miyazaki argues that LMFs are created during distressed times, when members are willing to accept wage reductions and concessions rather than face unemployment. Under more positive conditions, that firm will degenerate. His conclusion is that the LMF comes into existence when its original form faces economic hardship, and this will be the only state in which it will have stability.

Ben-Ner provides a proof of the final stage of the life cycle theory, known as the degeneration stage. Here, members are replaced by hired workers until the LMF returns to being a traditional firm. Ben-Ner states "if there is a feasible successful LMF, then the optimal LMF will contain only one member with the rest of the workforce consisting of hired wage laborers."⁶⁶ It will thus maximize total profit and will be identical to a private for-profit organization.

Rosen and Young (1990)⁶⁷ believe that the success of employee owned firms not only lies with employees, but with management and their particular style of managing these firms. The authors assert that a participatory style of management is necessary to have a successful employee owned firm. If management

⁶⁶ Ben-Ner, Avner, 1984, "The Life Cycle of Worker Owned Firms in Market Economies", *Journal of Economic Behavior and Organization*, 287-311

⁶⁷ Rosen, C., & Young, K., 1990, Understanding Employee Ownership, Cornell University Press, Ithaca, NY

is not hands-on or participatory, the success of the firm will be limited. This ownership theory of management, or Theory O, is one of the most critical determinants in the success of the employee owned firm. The authors noted that upon studying the success of employee owned firms, the firms that had the highest rates of growth were those that were managed in this way.

Chapter 4

The Economics of the Airline Industry

This chapter will focus on the unique economic structure of the airline industry. It is imperative to understand how the industry is structured in order to better understand the economic effects that employee ownership can have upon it.

The airline industry that we know today is very different from the airline industry of the past. While people have long had a fascination with flight, passenger flying was very slow to gain acceptance. The first scheduled airline flight was on January 1st 1914; an 18 minute trip across Tampa Bay, Florida. Most of the general public still remained leery of flying, so the early aviation industry was used primarily for freight and mail transport, as well as for military purposes.

The government felt the need to regulate the industry was becoming necessary. Regulation began in the 1920's when the Federal government awarded carriers with contracts to carry mail. Airmail was the major source of revenue for the industry during this time. In 1938, Congress established the Civil Aeronautics Board (CAB). The CAB was in charge of regulating the airlines. It also had the power to determine routes and rates, and to insure

airline safety. The power of the CAB remained unchallenged until 1978.

There were several factors leading to the deregulation of the airline industry. One of these were the advances in aircraft design. Carriers were now able to transport larger numbers of passengers and goods. Unfortunately, the economy was also experiencing an oil crisis, which led to skyrocketing fuel costs. These events, coupled with a general economic slowdown, put the airlines in financial strain. This led to the CAB allowing carriers to increase their prices. This action eventually led to the deregulation of the industry.

The Airline Deregulation Act was passed in 1978. At the core of the act was the belief that creating a free, market-driven industry would benefit society overall. The act outlined several key elements of importance:

- encourage and develop an air transportation system to meet the present and future needs of foreign and domestic commerce, the Postal Service, and national defense,
- to regulate air transportation in such a manner that...insures the highest levels of safety,
- to foster sound economic conditions, and improve and coordinate relations between carriers,
- to promote air service at reasonable charges without

discrimination,

- to promote competition,
- to regulate air commerce to best promote its development and safety, and
- to encourage and develop policies that would help the industry grow ⁶⁸

The act did not completely sever ties with the government. It merely reduced the amount of regulation on fares and routes, and attempted to foster a healthy level of competition. As a result, the CAB was abolished in 1984, and its remaining functions were transferred to the Department of Transportation (DOT).

Several aspects of the industry still remain regulated. Some of these include:

- the awarding of landing rights in foreign countries to US carriers
- the authority to approve agreements between and affecting international air transportation
- the responsibility to insure that air service remains accessible to small communities
- the responsibility to regulate the airlines on all matters concerning safety.

⁶⁸ Pitt, Ivan L., and Norsworthy, John R., 1999, Economics of the US Commercial Airline Industry: Productivity, Technology and Deregulation, Kluwer Academic Publishers, Boston

Many positive aspects have come from deregulation. One such aspect was the development of hub networks. Hubs are strategically located airports used for the transfer and collection of both passengers and cargo. Hubs enable carriers to offer more diverse service to larger areas and to increase passenger loads.

New carriers and increased competition are also a result of deregulation. With less government control, new carriers were able to enter the market and compete effectively with larger airlines. All this led to decreasing fares and a significant growth in air transportation.

The structure of the industry is also unique. Airlines are classified into one of three categories:

1. Major: Annual revenues of over \$1 billion annually
 2. National: Annual revenues between \$100 million and \$1 billion annually
 3. Regional: Annual revenues below \$100 million annually
- and within these categories, cargo carriers are included as well. There are other characteristics that set the airlines apart from other industries as well.

Airlines are fundamentally a service industry, but more specifically, an undifferentiated product. Because of this,

product loyalty tends not to be a great within the airline industry. Many travelers will simply shop until they get the best ticket price or departure times, often regardless of who the carrier may be. In order to attract the most customers, airlines have been in the position of having to provide the absolute best: the best fares, the most accommodating schedules and other in-flight incentives for as little money as possible.

This all occurs in an already extremely capital intensive industry. Airlines require an enormous amount of various equipment, services and facilities to operate effectively. The equipment and facilities by far are some of the most expensive of any industry. Carriers must rely on loans and leases, to acquire the equipment they need, as well as maintaining the equipment and facilities they already have. According to the DOT, the typical costs of running an airline can be broken down as such:

- Flight operations: 27%
- Maintenance: 13%
- Traffic/Aircraft service: 16%
- Promotion/Sales: 13%
- Passenger service: 9%
- Transport related: 10%
- Administrative: 6%
- Depreciation: 6%

Along with being extremely capital intensive, the airlines are very labor intensive as well. Pilots, mechanics, flight attendants, grounds crews, corporate personnel and more add up to over 1.3 million people employed by the airlines.⁶⁹ The industry tends to be highly unionized, and has a history wrought with labor/management conflicts and serious contract negotiations. Overall, labor costs account for 35% of all operating expenses. Due to this, profit margins in the airline industry tend to be very thin. On average, net profit for an airline is 1-2%.

Approximately 75% of the airline industry's revenues come from passengers. It is easy to see how in a deregulated market-driven economy, the competition for these passengers with an undifferentiated product is tremendous. Almost 80% of the passenger revenues comes from domestic travel, while the remaining 20% comes from international travel. Up to 90% of airline tickets are discounted, making it extremely important to fill all available seats on all available flights. This "break-even load factor" is the percentage of seats the airline has in service that it must sell in order to cover its costs.⁷⁰ The industry average break even load factor has been approximately 66% in recent years.

⁶⁹ Bureau of Labor Statistics, 2000 figure

⁷⁰ Air Transport Association

The airline business is also an incredibly seasonal one, and highly effected by business cycles. Airline revenues constantly rise and fall in significant levels throughout the course of the year. During good economic times, the airlines tend to flourish: business travel is increased, and the increased personal income of the consumer often gets spent on travel and entertainment. When the economy is in a recession, or experiences any time of difficulty, airline revenues follow suit and are diminished. Therefore, the airlines need extremely large quantities of capital to operate daily and to weather any economic storms.

Since the demise of the CAB, airlines have had the ability to control their own fares. Because the industry is so competitive, if one carrier announces rate cuts, the other carriers tend to follow suit.

In the pursuit of efficiency and passengers, airlines have also worked out alliances and code sharing agreements with fellow carriers. Code sharing enables a ticketing airline to issue tickets on the operating airline and to use that airlines code when doing so. All the major airlines have code sharing agreements with regional carriers, and even with other major airlines. Alliances, or domestic partnerships, are relationships between carriers that can allow them to coordinate schedules,

share frequent flyer miles and joint marketing of flights. These agreements are generally viewed as a way to avoid mergers or acquisitions of other airlines. It has been debated that through code sharing and alliances, carriers can reap 30-80% of the benefits of a merger without incurring the risks. This makes them highly desirable.

The terrorist attacks of 9/11 have added an entire new dimension to airline economics. While insurance costs for airlines have always been high, they have increased at a rate that made them unmanageable. Increased and extremely high security costs are also plaguing the industry. The federal government has made the airlines meet many new safety and security requirements. These new requirements are very costly, and as of this writing, the majority of the cost has fallen on the industry. Although the government has given the airlines some financial assistance in the wake of 9/11, it has not been enough to make all the necessary changes and keep the industry afloat at the same time.

Given an industry with high capital and labor intensity, fierce competition, thin profit margins, increasing security costs and decreasing passenger revenues, it is easy to how employee ownership would be an attractive option to promote efficiency, reduce costs and keep the airlines in flight.

Chapter 5

The Airline Industry Since September 11th 2001

Air transportation is without question the business sector most dramatically impacted by the terrorist attacks of September 11, 2001. The industry has suffered monumental and unprecedented losses. Many analysts and industry insiders wonder if the airlines will recover at all. Steps have been taken toward recovery, but the industry that is emerging is quite different from the industry that existed prior to 9/11. This "new" airline industry faces new costs and challenges, as well as the very real possibility of takeover by the government.

In the months prior to 9/11, the airlines were expecting to face some difficult economic times. The Air Transport Association forecasted that passenger traffic would increase by only 1% in 2001, and were anticipating overall net losses of approximately \$3.5 billion industry wide. Despite this, carriers felt strong enough to weather the storm. Good economic conditions, as well as a healthy travel market, enabled the industry to store \$11 billion in reserves in the post Gulf War years. There were no carriers in bankruptcy, and employment levels within the industry were at an all time high.

This seemingly manageable picture became beyond manageable, perhaps even beyond recoverable within 24 hours of the previously stated scenario. By turning commercial aircraft into guided missiles, terrorists destroyed the industry, as well as the safety and well being that the American public felt about their lives in general. Both United and American lost 2 aircraft that day. Air traffic was shut down at 9:49AM on September 11th, and did not reopen until September 13th. In an industry where 2 empty seats can mean the difference between a profitable or non-profitable flight, a two day shutdown can be devastating. It is estimated that this two day shutdown cost the industry over \$330 million dollars per day.⁷¹

When the airports did reopen on September 13th, they opened to a demand that was practically non-existent. Extreme financial losses, combined with the public's fear and reluctance to fly, left the airlines facing the most daunting financial time ever.

⁷¹ Air Transport Association

Table I:
Airline Industry Statistics: 9/10/2001-12/31/2002

	9/10/2001	12/31/2001	12/31/2002
Cash Reserves	\$11 Billion	\$10 Billion	\$8.3 Billion
Employees	690,000	620,000	530,000
Fleet	5000 aircraft	4700 aircraft	4600 aircraft
Predicted Loss	\$3.5 Billion	\$8.2 Billion	\$11.3 Billion
Carriers in bankruptcy	0	4	4

The effects of the attacks upon the industry were immediate. (see Table I) On September 13th, Midway Airlines, who had been experiencing economic difficulties, never resumed flying when the airports reopened. By September 15th, airlines began slashing jobs, which to date total approximately 100,000 positions. The impact rippled through related sectors as well. Boeing announced its decision to cut 30,000 jobs on September 18th. The travel and tourism industry began a downward spiral from which it is still recovering.

The industry is also facing new and enormous challenges. Costs for the airlines have gone up dramatically. On September 22nd, Congress agreed to a financial aid package of \$15 Billion. The Air Transportation Safety and System Stabilization Act (ATSSA) provided the airlines with \$10 billion in loans and

credits, as well as \$5 billion to cover immediate losses. In spite of this infusion of cash, net losses for 2001 still exceeded \$7.7 billion.⁷²

Another step taken by the government was the passing of the Aviation and Transportation Security Act on November 16, 2001. This act created the Transportation Security Administration (TSA). The TSA was just the beginning of the new airline security system. All this additional security comes at a price, and most of it the industry will have to cover on its own. With the implementation of new security measures, more than \$4 billion has been added to the industry's annual costs. These costs occur mostly in the forms of taxes, fees and unfunded mandates.⁷³

Liability insurance costs for the airlines have tripled since 9/11. Insurers had traditionally provided "war-risk" insurance at pennies per passenger. However, with the tremendous amount of uncertainty that now exists, insurers have increased war-risk insurance to the point that it became unaffordable for carriers. As a result, the Homeland Security Act included provisions for the FAA to expand its war risk policies to cover

⁷² Air Transport Association

⁷³ These items include ramp security, aircraft security, checkpoint documentation, screening of catering supplies, que management, security equipment, airport space now occupied by the TSB, training, fingerprinting, baggage checking, increasing airport rents, increasing landing fees.

passengers and crews. This coverage is costing the industry approximately \$140 million annually.

In addition to the 9/11 attacks, the war with Iraq also presents additional sets of concerns for the industry. The cost of fuel is the industry's second largest operating expense. Along with war in the Middle East come the possibility of extremely high oil prices. This would put another wrench in any attempts at recovery.

The Air Transport Association estimates that war with Iraq would result in an additional \$10.7 billion loss for the airlines, as well as 70,000 additional job losses. To this, add travel advisories and the SARS virus. As a result, the number of passengers enplaned continues to fall.

Skyrocketing costs, decreasing passenger loads and an uncertain future are not faring well for the airlines. The ATA fears the very real possibility of nationalizing the airline industry. Midway, United and US Air have all filed for bankruptcy. Total industry losses are at \$18 billion and 100,000 jobs. In an attempt to avoid bankruptcy, American announced the implementation of an ESOP. American plans to sell 25% of the company's stock to employees in lieu of wages and other concessions. The plan came close to being vetoed when employees

learned of the healthy executive compensation packages upper management was receiving while lower level employees were being terminated due to financial crisis. As a result, Don Carty, CEO of American Airlines, resigned amid the controversy, and the executive compensation packages were revamped. American's ESOP is being implemented as planned. Whether or not American's plan will be a success remains to be seen.

Table IIAirline Industry Timeline Since 9/11/01

9/11/01	Terrorists attack WTC and Pentagon with 4 hijacked airliners. Air traffic is grounded for 2 days and reopens to little or no demand
9/15/01	Continental cuts 12,000 jobs; Continental, Delta, American and Northwest cut schedules
9/18/01	Boeing announces 30,000 job cuts
9/19/01	United announces 20,000 layoffs
9/21/01	ATSSA enacted
10/7/01	Airlines begin dead bolting cockpit doors. Some begin to ponder the possibility of arming pilots with guns.
11/19/01	Bush signs ATSA.
2/1/02	United announces loss of \$2.1 billion in 2001. This is the largest loss in aviation history
2/19/02	Southwest announces plans to hire 4000 people. Thus far, Southwest has been the only carrier to weather the storm with no layoffs and continued profits.
8/22/02	US Air files for bankruptcy
12/9/02	United files for bankruptcy, wiping out shareholder equity including 55% ownership stake of employees. United also slashes an additional 9,000 jobs
12/31/02	Northwest cuts 12,000 jobs from 9/11 - 12/02
3/11/01	ATA announces war with Iraq could cost airlines an additional 70,000 jobs
4/14/03	American announces the implementation of an employee ownership plan to help weather the difficult times.
4/27/03	American avoids bankruptcy amid controversy re: executive compensation. American CEO Don Carty resigns amid the controversy.

Chapter 6

Methodology and Results

The purpose of this dissertation is to determine if a positive relationship exists between employee ownership, firm financial performance, and firm productivity within the US commercial airline industry. Many other industries have been very successful with employee ownership (ex: plywood), and contribute their continued success and growth and stability to this type of organizational structure. This paper will determine if employee ownership has a positive effect upon the airline industry as a whole. This chapter outlines the steps and procedures utilized in this project.

The tests utilized in this study will examine 10 major US commercial airlines over a 10 year period. The airlines being studied are: American Airlines, United Airlines, Delta Airlines, Continental Airlines, Northwest Airlines, Southwest Airlines, Alaska Air, US Airways, America West and TWA.⁷⁴ These carriers consistently represent the top 10 domestic airlines during the time period studied. Additionally, during this time period, all airlines implemented employee ownership plans in varying degrees:

⁷⁴ Information for TWA includes the years 1992-1999. Effective 2000, TWA was purchased by American Airlines, and their operating statistics are included with American's after that date.

from initial non-existence of plans, to small percentages of ownership stake used as a bargaining mechanism, and finally, to situations that included majority ownership and board membership

Data has been accumulated through a variety of sources. Much data has been obtained through SEC filings (10Q and 10K). When necessary, additional information was obtained through direct company contact via letter or telephone interview, through contact with union representatives from the Airline Pilots Association (ALPA) and the International Association of Machinists (IAM), from human resources administrators, and also through contact with company employees. Other sources of data include select databases (WSRN, Morningstar, Hoovers, Edgar, and Mergent), the Bureau of Labor Statistics, the US Department of Transportation, and the Air Transport Association.

Productivity and financial performance are the dependent variables in this study. Both are measured in a variety of ways to examine their relationship to employee ownership more carefully. The models being utilized to test each of the dependent variables are explained below.

Productivity

Productivity is measured using a Cobb-Douglas production function with constant returns to scale. The model is modified to

incorporate employee ownership as a "labor augmenting variable".⁷⁵

This study utilizes a Cobb-Douglas with CRS for several reasons. First, this approach has been widely utilized and accepted in prior research done on employee ownership. This will allow for consistency within the research. Secondly, in previous theories of labor managed firms, CRS is also assumed. Finally, much research has shown that with a Cobb-Douglas production function, estimates have closely corresponded with reality. Cobb and Douglas found this to be true, both over time and in cross section analysis. Additional researchers have also supported these findings.

Productivity will be measured using three different dependant variables: total revenue, passengers serviced per employee, and revenue passenger miles. There are advantages to using these measures. Total revenue is a commonly cited indicator of firm success, and therefore efficiency. Additionally, passengers serviced per employee examines how efficiently the labor force of each firm is operating. Revenue passenger miles (RPMs) are a statistic unique to the airline industry. RPMs are defined as one fare paying passenger

⁷⁵ Michael Conte and Jan Svenjar utilized this method in "Measuring Productivity Effects of Worker Participation and Ownership" 1981; as well as by Jones and Backus in "British Produce Cooperatives in the Footwear Industry". Similar derivations have been used by Cable and Fitzroy, Svenjar, Jones and Svenjar, and Rooney 1986., where employee ownership was treated as a "disembodied technical change".

transported one mile. RPMs are the most commonly cited airline industry statistic with regard to productivity. All firms can easily provide data, or data in these areas is readily accessible. This allows for easier comparison between firms.

We begin by stating the null and alternate hypothesis:

H_0 : There is no relationship between the existence of employee ownership plans, firm productivity and firm financial performance.

H_a : A positive relationship exists between the existence of employee ownership plans, firm productivity and firm financial performance.

The main model takes the form:

$$Y_t = AK^{\beta_1} L^{\beta_2} EO^{\beta_3} \epsilon_t \quad (1)$$

this in logarithmic form becomes:

$$\ln Y_t = \ln A + \beta_1 \ln K + \beta_2 \ln L + \beta_3 \ln EO + \epsilon_t \quad (2)$$

where:

Y_t = Revenue at time t or

Passenger serviced per employee at time t or

Revenue Passenger Miles (RPMs) at time t

A = the intercept

K = firm physical capital measured by net property and equipment

at time t

L = total number of employees in firm at time t

EO = percentage of firm that is employee owned at time t

Percentage of firm that is employee owned is based upon the following scale:

<0 - 10% = 1

11- 20% = 2

21 - 30% = 3

31 - 40% = 4

41 - 50% = 5

greater than 50 % = 6

This scale was utilized for several reasons. First, some carriers such as Southwest and United, have been very vocal regarding their employee ownership plans, and have been extremely accurate and careful regarding percentage of firm ownership during various times of the programs existence. Other companies have not been as stringent. Many had allocated certain total percentages to employee ownership plans, but never gave all the allocated amounts to employees. Their records indicate a range within a few percentage points. Therefore, the scale was created to allow for these cases.

Tests for productivity are being conducted on an industry wide basis. Regressions were conducted using a panel data model

with fixed effects for time. All results have been corrected for heteroskedasticity. Where deemed necessary (Durbin Watson statistic was less than 1.5 or greater than 2.5), results were corrected for autocorrelation, which LIMDEP, the software utilized in this study, has the ability to do. The model allowed for 10 dummy variables for time.

Annual data for the time period 1992-2002 was used. The top ten domestic airlines were studied. Information relevant to this study was available for all airlines. In addition, throughout this time period, all airlines had implemented ESOPs at one time or another and in varying degrees. These degrees ranged from 0 to 55%.

Test results relative to productivity are based upon a sample size of 105 observations with 91 degrees of freedom. A one-tailed test was used, as a positive relationship was being investigated. The level of significance (α) of .05 is being used. Under these parameters, the critical t value is 1.662 and the critical F value is 1.829 for all independent variables in these tests.

The regression results using revenue, passengers serviced per employee and revenue passenger miles are shown on Table III, IV and V.

Table III:
Airline Productivity and Employee Ownership⁷⁶
 $Y_t = \text{LN REVENUE}$

Variable	Coefficient	T-ratio	P[T]>t
LNK	.337797	3.036	.0031
LNL	.66581	5.273	.0000
LNEO	-.32373	-.533	.5950
Adjusted R2 = .86884			
Durbin Watson Statistic = 2.02376			
F[13,91]=53.99 Prob. = .0000			

Table IV:
Airline Productivity and Employee Ownership
 $Y_t = \text{LN PASSENGERS SERVICED/EMPLOYEE}$

Variable	Coefficient	T-ratio	P[T]>t
LNK	.314545	5.829	.0000
LNL	-.581279	-7.591	.0000
LNEO	.57328	1.274	.2058
Adjusted R2= .38738			
Durbin Watson = .42093 (2.143 corrected)			
F=[13,91]=6.06 Prob. = .00000			

Table V:
Airline Productivity and Employee Ownership
 $Y_t = \text{LN REVENUE PASSENGER MILES (RPM/s)}$

Variable	Coefficient	T-ratio	P[T]>t
LNK	.78461	1.355	.1787
LNL	.87732	11.769	.0000
LNEO	.16121	3.681	.0004
Adjusted R2= .90836			
Durbin Watson = 1.495 (2.025 corrected)			
F=[13,91]= 80.30 Prob. = .00000			

⁷⁶ All results in Tables III, IV and V have been corrected, when necessary, for autocorrelation and heteroskedasticity by Limdep.

Table III shows regression results testing for the effects of employee ownership upon productivity. Using revenue as the dependant variable, a Durbin Watson statistic of 2.023 falls within the generally accepted range, indicating no need to correct for autocorrelation. The adjusted R^2 is equal to .86884, indicating a good fit among the variables. A sample size of 105 observations is present, with 91 degrees of freedom. As previously stated, a level of significance of $\alpha = .05$ is used. Based upon this, a critical t value of 1.662 exists for all independent variables. Positive and statistically significant results exist between Revenue and LnK ($t=3.036$, $P(T)=.0031$) and LnL ($t=5.273$, $P(T)=.0000$). The t-ratio relative to employee ownership (LNEO) is $-.533$, with $p(t) .5950$. These results lead us to accept the null hypothesis that no positive relationship exists between employee ownership and productivity when measured by revenue.

Using passengers serviced per employee as the dependant variable in Table IV, the Durbin Watson statistic of .42092 indicates the need to correct for autocorrelation. This has been done, and a corrected Durbin Watson value of 2.143 was calculated. All results have been corrected for heteroskedasticity. An adjusted $R^2 = .38738$, and $F= 6.06$ with a P value of .0000 have also been found. Under the same parameters

tested earlier ($\alpha=.05$ with 91 degrees of freedom), a critical t value of 1.662 is present for all independent variables. A t -ratio relative to employee ownership is 1.274, with $p(t) = .2058$. These results support the acceptance of the null hypothesis that no positive relationship exists between employee ownership and productivity when measured by passengers serviced per employee.

The independent variables LnL and LnK both generated statistically significant results with regard to passengers serviced per employee. This seems logical for LnK ($t=5.829$). The results for LnL however, were negative ($t=-7.591$). This can be explained by the differences in services provided by the carriers studied. These different airlines have different product and operating characteristics and, most important, different stage lengths (average flight distances). Therefore, a large airline with a lot of employees (like United, Delta, or American) appear to be less productive in terms of passengers enplaned per employee than a smaller airline (like Southwest), because these carriers provide a more complicated product (longer-hauls, international travel etc.) Additionally, each of the larger airlines carries a typical passenger much further. The nature of their operation is that it should require more employee activity per passenger (i.e., fewer passengers carried per employee).

Revenue passenger miles (RPMs) is the dependent variable tested. Initial results give a Durbin Watson statistic of 1.49, indicating the need for autocorrelation correction. Upon correction, Durbin Watson is now equal to 2.02512. An adjusted R^2 of .90836 is also present, indicating a good fit among the variables. A high F value of 80.30 is also present. A calculated t-ratio = 3.681 with $P(t) = .0004$ (critical $t = 1.662$) is present relative to employee ownership (LNEO), indicating a positive and statistically significant result. The coefficient for the variable LnEO is .16121, indicating that a one unit increase in the LnEO will produce a .161 unit increase in the average value of RPMs. Therefore, we will reject the null hypothesis, and conclude that a strong, positive relationship exists between employee ownership programs and productivity when measured by revenue passenger miles. LnL also has shown positive and statistically significant results relative to revenue passenger miles.

Financial Performance

Firm financial performance will be measured a variety of ways: net profit or loss (Net P/L), return on assets (ROA), Net Profit Margin (NPM) and Operating Profit Margin (OPM). Firm financial performance will be tested using the following model:

$$\text{Model : } Y_t = \beta_0 + \beta_1 (\text{ESOP}) + \beta_2 (\text{CL/CA}) + \beta_3 (\text{Et/Pt}) \quad (3)$$

Where: Y_t = profitability, measured in terms of

Net P/L, ROA, OPM, NPM

ESOP = percentage of firm owned by employees at time t

CL = current liabilities

CA = current assets

Et = earnings per share at date t

Pt = closing price at date t

Again, percentage of employee ownership of the firm is based upon the same scale used in the tests for productivity.

The above variables have been selected for several reasons. First, both CL/CA and Et/Pt good measure of the firms current financial position. The closing price of stock and stock price variability, either positive or negative, are a good indicator not only of the value of the firm, but of the markets confidence in firm as well. Profitability ratios are a good way to determine the financial health of a firm. Net profit or loss also a good indicator of financial performance. Additionally, this type of information is available from all firms involved in the study.

Here again, tests are being conducted to see if there exists industry wide effects of employee ownership upon financial performance. The model is tested using a panel data model with

fixed effects for time. The period being studied is 1992-2002. The same airlines are being studied, and again, 10 dummy variables are being utilized for time. A one-tail test is being used, as the existence of a positive relationship is being researched. In tests of financial performance, we again have 105 observations and 91 degrees of freedom, giving a critical values of $t = 1.662$ and $F = 1.829$ for all variables studied.

The following tables lists the regression results for each dependent variable with regard to firm financial performance.

TABLE VI
FINANCIAL PERFORMANCE AND EMPLOYEE OWNERSHIP ⁷⁷
 $Y_t = \text{NET PROFIT LOSS}$

Variable	Coefficient	T=ratio	P[T]>t
CL/CA	-273423188	-1.888	.0662
Et/Pt	64125036	3.708	.0004
EO	33006450	.838	.4045
Adjusted R2= .54869			
Durbin Waston = 1.286 (2.049 corrected)			
F=[13,91]= 10.73 Prob. = .00000			

TABLE VII
FINANCIAL PERFORMANCE AND EMPLOYEE OWNERSHIP
 $Y_t = \text{ROA}$

Variable	Coefficient	T=ratio	P[T]>t
CL/CA	-5.6714	-4.392	.0000
Et/Pt	.451585	2.929	.0043
EO	-.13544	-.386	.7008
Adjusted R2= .50565			
Durbin Waston = 1.257 (1.957 corrected)			
F=[13,91]= 9.18 Prob. = .00000			

⁷⁷ All results in Tables VI and VII have been corrected, where necessary, for autocorrelation and heteroskedasticity, by Limdep.

TABLE VIII
FINANCIAL PERFORMANCE AND EMPLOYEE OWNERSHIP⁷⁸
 $Y_t = OPM$

Variable	Coefficient	T=ratio	P[T]>t
CL/CA	-3.3258	-2.000	.0485
Et/Pt	.56382	2.839	.0056
EO	-.521149	-1.152	.2525
Adjusted R2= .44231			
Durbin Watson = 1.236 (1.96312 corrected)			
F=[13,91]= 7.34 Prob. = .00000			

TABLE IX
FINANCIAL PERFORMANCE AND EMPLOYEE OWNERSHIP
 $Y_t = NPM$

Variable	Coefficient	T=ratio	P[T]>t
CL/CA	-3.4166	-2.666	.0091
Et/Pt	1.00657	6.579	.0000
EO	-.2464	-.707	.4816
Adjusted R2= .58557			
Durbin Watson = 1.56 (2.02929 corrected)			
F=[13,91]= 12.3 Prob. = .00000			

⁷⁸ All results in Tables VIII and IX have been corrected, where necessary, for autocorrelation and heteroskedasticity, by Limdep

Using net profit/loss as the dependant variable in Table VI, initial Durbin Watson results indicate the need to correct for autocorrelation (initial Durbin Watson equaled 1.286). Therefore, all results have been corrected for autocorrelation and heteroskedasticity. The corrected Durbin Watson is now equal to 2.04961. Adjusted R^2 and F test results are .54869 and 10.73 respectively. Critical value of $t = 1.662$ exists under the conditions of $\alpha = .05$ with 91 degrees of freedom. Employee ownership (EO) returns a t-ratio of .838, and $P(t) = .4045$. All these results lead to the acceptance of H_0 and the conclusion that no positive relationship exists between employee ownership and financial performance when measured by net profit or loss. The variable E_t/P_t yielded the only positive and statistically significant results with regard to net profit/loss.

Return on assets as the key dependant variable (Table VII) required autocorrelation correction. The initial Durbin Watson of 1.2573 has been corrected and is now 1.95704. Adjusted $R^2 = .50565$ and $F = 9.18$ with $P = .0000$, all indicating an acceptable fit within the model. With 91 degrees of freedom at $\alpha = .05$, the critical value for t is 1.662. The t-ratio relative to employee ownership (EO) within this model is $-.386$ with $P(t) = .7008$. These results support acceptance of the null hypothesis that no positive relationship exists between employee ownership and firm financial performance when measured by return on assets.

Initial results using operating profit margin as the key dependant variable indicate the need for autocorrelation correction (DW = 1.23683). Upon correction, the new Durbin Watson = 1.96312. All results have been corrected for heteroskedasticity. An F value of 7.34 was returned, as was an adjusted R^2 of .44231. The P value relative to F is .0000. Results for employee ownership (EO) include a calculated $t = -1.152$ with $P(t) = .2525$. Critical t value for this test is 1.662. These results again reinforce the hypothesis that no positive relationship exists between employee ownership and financial performance when measured by OPM. The null hypothesis is accepted.

Net profit margin is the final dependant variable used to test financial performance. The initial Durbin Watson was calculated at 1.56. This falls into the general range of acceptance, although by a very small amount. Therefore, corrections for autocorrelation were added. The corrected DW = 2.02929. Again, all results have been corrected for heteroskedasticity. An adjusted R^2 of .58557 is present, as well as $F = 12.3$ with $P = .0000$. Calculated t values relative to employee ownership (EO) for this test are -0.707 with $p(t) = .4816$. Critical value for this model is 1.662. This reinforces H_0 , and leads to the conclusion that no positive relationship exists between employee ownership and firm financial performance when

measured by net profit margin. Overall, the existence of employee ownership plans seem to have no effect upon firm financial performance with the airline industry as a whole.

It may be possible that the insignificant relationship between employee ownership and some of the dependant variables could be attributed to the events of September 11, 2001. The industry was and continues to be devastated since that day, especially financially, where most of the insignificant results were found.

To better understand if in fact these results were dramatically affected by September 11th, the following tables repeat the tests utilized in the preceding pages. This time, the time periods of 2001 and 2002 are not included in the sample. The same airlines are studied, using the same panel data model and dummy variables for time. Industry wide effects will be determined. Included are 87 observations with 75 degrees of freedom. The level of significance remains at $\alpha = .05$. A one tail test is again utilized, and resulting critical values of $t = 1.666$ and $F = 1.918$. The results are as follows:

TABLE X
PRODUCTIVITY AND EMPLOYEE OWNERSHIP PRE 9/11 ⁷⁹
Yt = LN Revenue (pre 9/11)

Variable	Coefficient	T=ratio	P[T]>t
LNK	.3173	2.65	.0098
LNL	.72991	5.679	.0000
LNEO	-.4777	-.726	.4700
Adjusted R2= .87091			
Durbin Waston = 2.2736			
F=[11,75]= 53.74 Prob. = .00000			

TABLE XI
PRODUCTIVITY AND EMPLOYEE OWNERSHIP PRE 9/11
Yt = LN Passengers serviced per employee (pre 9/11)

Variable	Coefficient	T=ratio	P[T]>t
LNK	.32959	5.094	.0000
LNL	-.59394	-7.061	.0000
LNEO	.61853	1.264	.2101
Adjusted R2= .39426			
Durbin Waston = .424 (1.871 corrected)			
F= 12.3 Prob. = .00000			

TABLE XII
PRODUCTIVITY AND EMPLOYEE OWNERSHIP PRE 9/11
Yt = LN RPM (pre 9/11)

Variable	Coefficient	T=ratio	P[T]>t
LNK	.10531	1.566	.1215
LNL	.85722	9.807	.0000
LNEO	.16951	3.334	.0013
Adjusted R2= .89803			
Durbin Waston = 1.600 (1.989 corrected)			
F= 69.86 Prob. = .00000			

⁷⁹ All results in Tables X, XI, and XII have been corrected, where necessary, for autocorrelation and heteroskedasticity, by Limdep

Table X lists results for productivity tests in the time period prior to September 11th, 2001. Using revenue as the dependant variable, a Durbin Watson statistic of 2.2736 indicates no autocorrelation problems. All results have been corrected for heteroskedasticity. Adjusted R^2 equals .87091, indicating a good fit among the variables. A value of $F = 53.74$ with $P = .0000$ was also found. With 75 degrees of freedom and $\alpha = .05$, critical $t = 1.666$ for all variables within the model. The t-ratio relative to employee ownership (LNEO) was calculated as $-.726$, with $p(t) = .47$. These results indicate the acceptance of H_0 : no positive relationship exists between employee ownership and productivity when measured by revenue in the years prior to 9/11. The independent variables $\ln K$ and $\ln L$ were both positive and statistically significant relative to revenue.

Passengers serviced per employee prior to 9/11/01 was the second dependant variable tested. An initial Durbin Watson statistic of .424 indicates the need for autocorrelation correction. The corrected Durbin Watson is 1.8791. All results have been corrected for heteroskedasticity. Adjusted R^2 was calculated at .39426, with an F test = 6.09 and $P = .0000$. Test statistics relative to employee ownership (LNEO) are $t = 1.264$ with $p(t) = .2101$. The critical value for this model is $t = 1.666$. These results lead to the conclusion that no positive relationship exists between employee ownership and productivity

when measured by passengers serviced per employee in the years prior to 9/11. Again, LnK and LnL both yield statistically significant results, with LnL being negative for the reasons previously cited.

Revenue passenger miles (RPMs) in the years prior to 9/11, is the final key dependant variable in Table XII. An initial Durbin Watson statistic of 1.6 falls within the range of acceptance, but by a small amount. Therefore, autocorrelation correction was utilized, resulting in a corrected DW = 1.98923. All results have been corrected for heteroskedasticity. Adjusted R^2 was calculated as .89803 indicating a good fit among the variables. An F test resulted in a value of 69.86 with $P = .0000$. The t-ratio relative to employee ownership was 3.334 with $P(t) = .0013$. These results fall into the rejection range for H_0 and allow us to conclude that a positive relationship exists between employee ownership and productivity in the years prior to 9/11 when measured by RPMs. The variable LnL also yielded positive and statistically significant results relative to revenue passenger miles.

Table XIII
FINANCIAL PERFORMANCE Pre 9/11/01 ⁸⁰
Yt = Net Profit/Loss (pre 9/11)

Variable	Coefficient	T=ratio	P[T]>t
CL/CA	-53439291	-.521	.6039
Et/Pt	227433178	4.029	.0001
EO	51632797	2.063	.0426
Adjusted R2= .51296			
Durbin Waston = 1.0349 (1.843 corrected)			
F= 9.23 Prob. = .00000			

Table XIV
FINANCIAL PERFORMANCE Pre 9/11/01
Yt = ROA (pre 9/11)

Variable	Coefficient	T=ratio	P[T]>t
CL/CA	-1.4352	-1.352	.1804
Et/Pt	4.5337	7.760	.0000
EO	-.2995	-1.156	.2514
Adjusted R2= .66311			
Durbin Waston = 1.55016 (2.0087 corrected)			
F= 16.39 Prob. = .00000			

⁸⁰ All results in Tables XIII and XIV have been corrected, where necessary, for autocorrelation and heteroskedasticity, by Limdep

Table XV
FINANCIAL PERFORMANCE Pre 9/11/01⁸¹
Yt = OPM pre 9/11

Variable	Coefficient	T=ratio	P[T]>t
CL/CA	1.225	.932	.3545
Et/Pt	5.4651	7.551	.0000
EO	-.229129	-.714	.4775
Adjusted R2=			.54532
Durbin Watson =			1.0364 (2.00657 corrected)
F=			10.38 Prob. = .00000

Table XVI
FINANCIAL PERFORMANCE Pre 9/11/01
Yt = NPM (pre 9/11)

Variable	Coefficient	T=ratio	P[T]>t
CL/CA	-.32617	-.036	.9715
Et/Pt	5.05979	10.098	.0000
EO	-.135158	-.608	.5449
Adjusted R2=			.72126
Durbin Watson =			1.1551 (1.995 corrected)
F=			21.23 Prob. = .00000

⁸¹ All results in Tables XV and XVI have been corrected, where necessary, for autocorrelation and heteroskedasticity, by Limdep

Net profit/loss was used in table XIII to test for financial effects of employee ownership prior to 9/11/01. An initial Durbin Watson statistic of 1.03495 indicated an autocorrelation problem, therefore results were corrected. The corrected Durbin Watson is equal to 1.843. Adjusted R^2 , F and P are .51296, 9.23 and .00000 respectively. The calculated t-ratio relative to employee ownership (EO) is 2.063 with a $p(t) = .0426$. Based upon these findings, we can reject the null hypothesis and conclude that a positive relationship between employee ownership and firm financial performance exists when measured by NPM in the years prior to 9/11. These results differ from the years including 9/11.

Using return on assets in the years prior to 9/11 as the dependant variable, initial Durbin Watson statistics fall within the accepted range but by a small amount (1.55016). Therefore, autocorrelation correction was utilized, resulting in a corrected Durbin Watson of 2.00875. All results have been corrected for heteroskedasticity. Adjusted R^2 is calculated at .6631. F test results in a value of 16.39 with $P = .0000$. The t-ratio relative to employee ownership (EO) -1.1.56, with $p(t) = .2514$. Based upon these results, we accept the null hypothesis and conclude that no positive relationship exists between employee ownership

and firm financial performance when measured by ROA in the time period prior to 9/11/01.

Operating profit margin in the years prior to 9/11 was the third variable tested in Table XV. Initial results indicate an autocorrelation problem (DW = 1.036). All results have been corrected for autocorrelation (corrected DW = 2.006) and heteroskedasticity. Adjusted R^2 is equal to .54532, and F tests give a value of 10.38 with a P value of .000. The critical t related to all variables in this test is 1.666. Calculated t relative to employee ownership (EO) is -.714 with $p(t) = .4775$. This confirms the null hypothesis that no positive relationship exists between employee ownership and firm financial performance in the years prior to 9/11 when measured by OPM.

The relationship between net profit margin and employee ownership in the years preceding 9/11 is also reexamined. Again, all results have been corrected for heteroskedasticity and autocorrelation (initial DW = 1.155; corrected DW = 1.995). Adjusted R^2 , F and P all confirm strength among the variables at .721, 21.23 and .0000 respectively. The critical t relative to all variables for this test is 1.666. Calculated t relative to employee ownership (EO) is -.608 with $p(t) = .5449$. This allows for acceptance of H_0 and concludes that no positive relationship

exists between employee ownership and financial performance when measured by NPM in the years preceding the terror attacks.

Overall results indicate that the existence of employee ownership plans have little or no effect upon firm productivity and firm financial performance within the airline industry. Productivity seems to respond slightly better to employee ownership. Revenue passenger miles, an industry norm of measuring productivity, had very positive and significant results with regards to the effect of employee ownership. Other variables for productivity were not significant. This is true in both the pre and post 9/11 economy.

Employee ownership appears to have no effect upon firm financial performance. This can confirm that carriers who implement ESOPs for the purely financial purposes, may in fact, never realize these benefits. The independent variable E_t/P_t is the only one that is positive and statistically significant relative to all dependant variables in both the pre and post 9/11 time periods.

Analyzing the industry in both a pre and post 9/11 economy provides further evidence of the effectiveness or ineffectiveness that ESOPs have within this particular industry. Results from the pre 9/11 years are almost identical to the results of the years

that include the attacks. Revenue passenger miles remains the only positive relationship with employee ownership and productivity in both the pre and post 9/11 industry. Net profit/loss also had a positive relationship with employee ownership prior to the 9/11 attacks. This is not surprising. All carriers, with the exception of Southwest, have lost monumental amounts of money in the time period since 9/11. Therefore, based upon this research, employee ownership plans have little or no effect upon productivity and firm financial performance within the airline industry as a whole.

One question that could be asked is why Southwest Airlines remained profitable and hired employees in the post 9/11 economy? While other carriers were filing for bankruptcy and laying off employees, the opposite was happening at Southwest. Southwest has one of the most highly regarded ESOPs in corporate America, and definitely within the airline industry. Many advocates of ESOPs, including the NCEO, attribute the success of Southwest in the wake of 9/11 to their ESOP.

United, the largest of all airlines, did not fare as well as Southwest did post 9/11. United laid off over 30,000 employees and announced losses of over \$2.1 billion; the largest in aviation history. United was forced to file for bankruptcy on 12/9/2002. Uniteds' ESOP was one of the most highly publicized

ESOPs in history of employee ownership. Advocates had high hopes and great expectations of what such a large plan, both in size and vision, could accomplish. This is no longer the case. Ironically, the demise of United was actually blamed, in part, on their employee ownership plan.

To determine if employee ownership was more successful in one airline than in another, I have added additional tests. Here I will be looking at Southwest and United individually. These two carriers were chosen for two reasons. First, each carrier was or still remains, a vocal advocate on the benefits of employee ownership and the potential that it can provide for companies and their employees. Secondly, despite their beliefs, each fared very differently in the post 9/11 world. This disparity in outcome questions if employee ownership played a more important role in one than it did in the other.

Each carrier is studied for productivity and financial performance over a ten year period, and quarterly data for each carrier will be used. Tests for productivity will use the same panel data model used in the previous productivity tests. The key dependant variables are LN Passengers serviced per employee and Revenue. Financial performance will be tested using NPM, OPM and ROA as the dependant variables. Again, the same model used to test for financial performance industry-wide will be used.

Critical values are being based on a one tail test, as again, a positive relationship is being tested $\alpha = .05$. With 40 observations and 28 degrees of freedom, critical values are $t = 1.701$ and $F = 2.151$. Results for tests on Southwest Airlines and United Airlines are listed on the following tables:

Table XVII:⁸²
PRODUCTIVITY (SOUTHWEST AIRLINES)
 $Y_t = \text{LN REVENUE}$

Variable	Coefficient	T=ratio	P[T]>t
LNK	.11653	.219	.8288
LNL	1.836	1.665	.1110
LNEO	-5.61	1.661	.1098
Adjusted R2= .90592			
Durbin Waston = 1.824			
F= 31.64 Prob. = .00000			

Table XVIII:
PRODUCTIVITY (SOUTHWEST AIRLINES)
 $Y_t = \text{LN PASSENGERS SERVICED/EMPLOYEE}$

Variable	Coefficient	T=ratio	P[T]>t
LNK	.25478	.771	.4481
LNL	-.89658	-1.292	.2088
LNEO	3.7633	1.780	.0877
Adjusted R2= .65915			
Durbin Waston = 2.0578			
F= 7.15 Prob. = .00000			

⁸² All results in Tables XVII and XVIII have been corrected, where necessary, for autocorrelation and heteroskedasticity, by Limdep.

Tests for productivity at Southwest Airlines use LN Revenue and LN passengers serviced per employee as the key dependant variables in Table XVII. With regard to revenue, a Durbin Watson = 1.824 indicates no autocorrelation correction necessary. An adjusted R2 of .90592 indicates a good fit among the variables. The t- ratio relative to employee ownership (LNEO) was calculated as 1.661. Critical t value for all variables within this test is 1.701. Therefore, calculated t falls into the range of acceptance of the null hypothesis, concluding that no relationship exists between employee ownership and productivity when measured by revenue at Southwest.

Table XVIII uses passengers serviced per employee is also used as a dependant variable. A Durbin Watson statistic of 2.0578 has been calculated, indicating no problem with autocorrelation. The t ratio relative to employee ownership (LNEO) was calculated as $t = 1.780$ with $p(t) = .0877$. Although we can reject the null hypothesis based upon the t ratio, the $p(t)$ exceeds α , therefore rendering the result insignificant.

Table XIX⁸³
UNITED AIRLINES PRODUCTIVITY
Yt = LN REVENUE

Variable	Coefficient	T=ratio	P[T]>t
LNK	1.4089	2.517	.0189
LNL	-1.2388	-1.551	.1339
LNEO	.16364	.371	.7136
Adjusted R2= .44711			
Durbin Waston = 1.992			
F= 3.57 Prob. = .00000			

Table XX
UNITED AIRLINES PRODUCTIVITY
Yt = LN PASSENGERS SERVICED/EMPLOYEE

Variable	Coefficient	T=ratio	P[T]>t
LNK	-.19154	-1.358	.1870
LNL	.51316	25.505	.0000
LNEO	-.15239	-1.373	.1825
Adjusted R2= .99011			
Durbin Waston = 1.601 (1.787 corrected)			
F= 319.59 Prob. = .00000			

⁸³ All results in Tables XIX and XX have been corrected, where necessary, for autocorrelation and heteroskedasticity, by Limdep.

Tests for productivity at United use the same dependant variables as the tests for Southwest. Table XIX analyzes results based upon revenue as the dependant variable. An Adjusted $R^2 = .44711$ was calculated, as was an $F = 3.57$. The Durbin Watson statistic indicated no autocorrelation problem ($DW = 1.992$). The t ratio relative to employee ownership is $t = .371$. With a critical value of $t = 1.701$, we can accept the null hypothesis and conclude that no positive relationship exists between employee ownership and productivity at United Airlines when based upon revenue.

Passengers serviced per employee is the second dependant variable tested. A Durbin Watson statistic of 1.601 was calculated. Although acceptable, autocorrelation correction was included, returning a corrected value of 1.787. An adjusted $R^2 = .99011$ indicates a very strong fit among the variables. The t ratio relative to employee ownership is -1.373 . Based upon this we can accept the null hypothesis and conclude that no relationship exists between employee ownership and productivity when measured by passengers serviced per employee at United Airlines.

TABLE XXI
SOUTHWEST AIRLINES FINANCIAL PERFORMANCE⁸⁴
Yt = ROA

Variable	Coefficient	T=ratio	P[T]>t
CL/CA	-.15740	-.293	.7720
Et/Pt	89.173	2.128	.0438
EO	.29698	2.225	.0357
Adjusted R2= .44711			
Durbin Watson = 1.850			
F= 2.28 Prob. = .00000			

TABLE XXI
SOUTHWEST AIRLINES FINANCIAL PERFORMANCE
Yt = OPM

Variable	Coefficient	T=ratio	P[T]>t
CL/CA	-2.249	-.778	.4442
Et/Pt	355.09	1.574	.1286
EO	1.1973	1.842	.0454
Adjusted R2= .37925			
Durbin Watson = 2.359			
F= 2.94 Prob. = .00000			

⁸⁴ All results in Tables XXI and XXII have been corrected, where necessary, for autocorrelation and heteroskedasticity, by Limdep.

Tables XXI studies the effect of employee ownership on firm financial performance at Southwest. Using ROA as the dependant variable, a Durbin Watson statistic of 1.85 indicates no autocorrelation correction necessary. A t ratio = 2.225 with $p(t) = .0357$ was calculated relative to employee ownership. Critical values are $t = 1.701$ and $\alpha = .05$. Based upon this, we can reject the null hypothesis and determine that a positive and statistically significant relationship exists between employee ownership and firm financial performance at Southwest Airlines. The independent variable Et/Pt also yields positive and statistically significant results.

Using OPM as the dependant variable, a Durbin Watson statistic of 2.359 was calculated, and falls within the general range of acceptance. The t ratio relative to employee was calculated as 1.842 with $p(t) = .0454$ (critical values are $t = 1.701$ and $\alpha = .05$). Again, we have positive and statistically significant results that allow for rejection of the null hypothesis. Therefore, it can be concluded that employee ownership and financial performance have a positive relationship at Southwest when measured by OPM.

Table XXIII
UNITED AIRLINES FINANCIAL PERFORMANCE⁸⁵
Y_t = ROA

Variable	Coefficient	T=ratio	P[T]>t
CL/CA	1.25219	1.401	.1740
Et/Pt	-.10685	-.901	.3764
EO	.23061	1.093	.2854
Adjusted R2= .55522			
Durbin Watson = 2.676 (2.50 corrected)			
F= 4.97 Prob. = .00050			

Table XXIV
UNITED AIRLINES FINANCIAL PERFORMANCE
Y_t = OPM

Variable	Coefficient	T=ratio	P[T]>t
CL/CA	1.8202	.320	.7514
Et/Pt	.27987	.037	.9707
EO	.52495	.391	.6992
Adjusted R2= .69590			
Durbin Watson = 2.50			
F= 8.28 Prob. = .00001			

⁸⁵ All results in Tables XXIII and XXIV have been corrected, where necessary, for autocorrelation and heteroskedasticity, by Limdep.

Table XXIII tests for financial performance at United Airlines. Using ROA, an initial DW = 2.676 is calculated. This falls out of the general range of acceptance, therefore autocorrelation correction was utilized. A corrected DW = 2.50 was calculated. Adjusted R^2 and F were calculated as .55522 and 4.97 respectively. The t ratio relative to employee ownership (EO) was calculated as 1.093. Critical t for this test is 1.701. Therefore, we can accept the null hypothesis and conclude that no relationship exists between employee ownership and financial performance at United Airlines when measured by ROA.

Using OPM as the dependant variable, test statistics returned include DW = 2.5, adjusted R^2 = .6959 and F= 8.28. The t statistic relative to employee ownership is calculated as .391 with $p(t)$ = .6992. This leads to the acceptance of H_0 and the conclusion that no positive relationship exists between employee ownership and financial performance when measured by OPM at United.

These results are quite interesting. While employee ownership seems to have no effect upon the industry as a whole, it does appear to have a very positive effect upon financial performance at Southwest. United, whose ESOP was larger in scope and percentage of ownership, has no significant results

whatsoever relative to their ESOP and the financial performance of the firm.

Productivity does not seem to be effected as well by the presence of an ESOP. In both industry and individual studies, the effects upon productivity were only minimally impressive.

Chapter 7

Summary and Conclusions

The purpose of this dissertation was to examine the effects of employee ownership within the airline industry, and to determine if a positive relationship existed between employee ownership, firm financial performance and productivity. The effect of employee ownership on productivity and financial performance has been questioned throughout the years, and has generated mixed results. The effects of employee ownership within the airline industry have thus far generated similar results.

Based upon my research, it has shown that employee ownership plans have little or no relationship with firm financial performance. This is based upon the profitability ratios ROA, OPM and NPM and the variable Net Profit/Loss used in this study.

Productivity received only slightly better results. There is a positive and statistically significant relationship between employee ownership and revenue passenger miles. Passengers serviced per employee and revenue did not generate results that would lead to the rejection of the null hypothesis.

Analyzing the airlines before 9/11 confirmed the fact that the employee ownership still had little or no relationship with financial performance prior to the economic difficulties they are currently experiencing. Regression results for pre and post 9/11 studies are relatively similar.

One question that could be asked is why Southwest Airlines remained profitable and hired employees in the post 9/11 economy? While other carriers were filing for bankruptcy and laying off employees, the opposite was happening at Southwest. Many advocates of ESOPs, including the NCEO, attribute the success of Southwest in the wake of 9/11 to their ESOP. To determine if their ESOP was instrumental in their success, additional regressions were conducted. Based upon the results of those tests, it became evident that the ESOP at Southwest help play a vital role in the financial survival of the firm during an economically stressful time period. Employee owners had a say in the running of the company post 9/11. Many offered to cut back on hours rather than lay off fellow employees. This team approach enables Southwest to have a competitive advantage over other carriers.

However, it is not only the ESOP that has made Southwest successful in this economy. At Southwest, the lower operating costs related to their no frills method of operation, has a huge

impact upon their success. Their open door management style, which enabled employees to voice their concerns, thoughts and ideas after September 11th, also added to that unified feeling and overall concern for the success of the firm.

When tested independently, United, the largest of all airlines, did not generate results as positive as Southwest. At United, there was no evidence of any positive relationship between their ESOP, productivity and financial performance. United has had mass lay offs and lost billions in the past 2 years. As stated before, the demise of United was actually blamed, in part, on their employee ownership plan. This is partially true. By the time United filed for bankruptcy in 12/02, they had the largest operating costs within the industry. These excessive costs were predominantly caused by the employee owners themselves. Strong labor unions, board membership and too much control by employees actually contributed to the downfall of United. Pilots and mechanics, now in positions of power, negotiated some of the most expensive salary increases and benefits packages in the industry. This, combined with the devastating impact of 9/11, made United one of the most unfortunate victims within the industry.

What makes employee ownership highly effective in one case and not another? Why has employee ownership been so successful in

other industries and not within the airlines? Why has Southwest been able to have success in the worst of times, while other carriers with employee ownership have failed dismally? Through this study, I have concluded that the following factors contribute to the success of an ESOP, as well as to the failure of them within the airline industry.

1. Conditions of the ESOPs implementation:

This conclusion supports previous studies done by Myazaki and Ben-Ner. The case of United provides direct evidence of this. United implemented it's ESOP during an economically difficult time in lieu of meeting workers demands of increased wages and other currently held benefits. As economic conditions improved, outside labor was hired. Additionally, existing employee owners began flexing their muscles. Excess wages not only went to new non-owner hires, but into the pockets of existing owner workers as well. Operating costs were driven up to the industries highest levels.

Southwest, on the other hand, has always been an employee owned firm. They did not implement their plan in a time of hardship. This is true with other successful employee owned industries as well. The lumber and steel industries have a long history of successful employee ownership. Employee ownership in these cases was not in lieu of wages and benefits, but was a

benefit in and of itself. It is part of the company culture. Most airline employees who were given these benefits instead of wage or salary increases, viewed the ESOP as a means to an end; a way to reach the desired outcome of higher wages and increased benefits. In other industries, the ESOP is seen as an end in itself.

2. The management philosophy of the company:

This is probably the most critical conclusion regarding the potential success of ESOPs. Southwest and other successful examples of employee ownership, pride themselves on their family-like approach to their employees and their businesses. Management makes a great effort to insure that employees know their voices are heard, and make them feel like part of the team responsible for the overall success of the company. While United attempted to head in this direction, they were far too large and did not have the true vision that employee ownership requires to be successful. United implemented their ESOP with the best of intentions, but the situation evolved into one of power and control. Both management and employee owners wanted to show their power without the best interest of the company in mind. This ultimately resulted in a struggle for internal control and competition, not one of mutual concern and benefit for the well-being of the company.

Traditionally, cooperatives and other successful labor managed firms, have been successful due to the equality felt among the workers. Within the airlines, this was not the case. Power control and internal competition became rampant. Many of the participants in employee ownership plans were already the higher paid employees, such as pilots. This led to much shirking and self serving behavior. While one intention of employee ownership is to reduce agency costs, within the airline industry, agency costs actually increased.

When the separation of ownership and control becomes eliminated in large corporations, the ability to be successful still exists, but must be handled the right way. But as the research as shown, it is not the ESOP alone that has helped make Southwest successful in this economy. Although it is not possible at this stage of research to know with absolute certainty, which factors are more important than others for companies with employee owners to achieve long term growth and financial success, my results have shown that the existence of the ESOP alone is inefficient. At Southwest, it's the lower operating costs related to their no frills method of operation, as well as their open door management style, that contributes to their success.

ESOPs can be highly effective and mutually beneficial if implemented for the right reasons. They are not a cure for a dying company. They should not be perceived as a get rich, gain control prospect for unions and laborers. This is what happened at United.

Management should not view ESOPs as a way to appease employees and cut costs. Instead, they should be implemented by management and employees together, with reasonable amounts of input by both parties, and mutual concern for the well being of the firm. When this is accomplished, the wealth can be shared by all and the ability to weather difficult times becomes easier. It is not a get rich quick scheme, but part of a vision for long term growth and prosperity. The 30,000 employees who have been laid off by United may want to think about this. Their still employed peers at Southwest have learned that the road to success is not a race, but walked in slow steady steps.

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ABSTRACT

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*"The Effects of Employee Ownership on Firm
Productivity and Firm Financial Performance: The Case of the
US Commercial Airline Industry"*

Dissertation directed by Dominick Salvatore, PhD

This paper examines whether there exists a relationship between employee ownership and the financial and productivity performances of the firm. The firm examined in this study is the U.S. commercial airline industry. The focus of this paper is on the airline industry, as in the years following deregulation of the airlines, many carriers implemented employee ownership plans in lieu of wage increases. Prior research in the field has indicated there is a positive relationship between employee ownership and firm performance. My data thus far has been consistent with most of the earlier findings, although I will be looking at how the employee owned airlines fared after September 11th, and the implementation of new plan since the terrorist attacks.

VITA

Rosemary T. DeRiso, daughter of Richard and Mary Blauvelt, was born on October 25th, 1965 in New York.. After graduating with a BS in 1987 from St. John's University, she went on to earn an MBA, also from St. John's. She worked for Time Warner Inc. while pursuing these degrees.

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