Title

The Contestable Claims of Shareholder Wealth Maximization: Evidence from the Airline Industry

Author
Gordon, Jeffrey

Publication Date
2001-04-23

LAW & ECONOMICS SEMINAR
Monday, April 28
4:20-6:00 pm, Boalt 13

The Contestable Claims of Shareholder Wealth Maximization: Evidence from the Airline Industry

Jeffrey N. Gordon

To Berkeley Workshop participants:

This is very much a work in progress. Creating a data set, as I have learned, goes more slowly than you would like. There may well be new models, new data, and new theories to present at the workshop along with the attached. But this draft should give you a sense of the project.

- Jeff Gordon

The Contestable Claims of Shareholder Wealth Maximization: Evidence from the Airline Industry

Jeffrey N. Gordon
Columbia Law School

Preliminary and Partial Draft

April 2001

Prepared for the exclusive use of the U C Berkeley Workshop
April 23, 2001

Jeffrey N. Gordon
Columbia Law School
435 W. 116th St.
New York, NY 10027
212/854-2316
jgordon@law.columbia.edu

4/01 DRAFT

The Contestable Claims of Shareholder Wealth Maximization: Evidence from the Airline Industry

Jeffrey N. Gordon*
Columbia Law School

Introduction: the Shareholder Criterion

The shareholder wealth maximization criterion ("shareholder criterion"), the idea that managers should run the firm to maximize the equity interest or "shareholder value," is the basis for the dominant view of corporate law and governance in the United States. The shareholder criterion is important not only because it gives guidance to managers about their role, but also because it implies a series of governance structures for the firm: for example, a board of directors selected exclusively by shareholder vote, and a set of fiduciary duties running from the board and the managers exclusively to the shareholders. Managers internalize the shareholder criterion as guiding and legitimating their action (subject only to concerns about their own interests, the so-called "agency costs" problem). It tells them what to do in the event of a conflict between shareholder interests and those of other potential claimants on the firm, such as employees, suppliers, or communities. It also helps managers resolve conflicts among shareholders who may be differently situated in time preference or risk preference. Insofar as shares trade on well-developed markets, managers may observe the shareholder criterion simply by maximizing the stock price. Equally important, shareholders internalize this criterion and may come to use it stringently in the evaluation of managerial performance.

A series of institutional complements reinforce the orientations of managers and shareholders in the United States. These include:

- the off-the rack governance rules of state law that spell out shareholder power and protection in the corporation, including voting rules, fiduciary duty rules, and standing criteria for maintaining a shareholder derivative suit;

- managerial compensation contracts that offer managers high-powered incentives to make decisions in shareholder interests, in particular, stock options;

- Favorable treatment for executive stock options under tax law and accounting

---

* I've had the help of many dedicated research assistants, especially Tom Akyali, John Ameriks, Masoud Anjomshoa, Ian Haft, Joanna Lin, David Silberman, Alison Wang, and Sandra Wittman. The "we" in this paper in referring to the data means to carry appreciation for their work. Masoud Anjomshoa ran the regressions.

rules that reduce the cost to the firm of such compensation;

- mandatory disclosure rules under the federal securities laws that are specifically focused on information needed by shareholders and that facilitate shareholder monitoring of managerial behavior;

- liquid securities markets that continuously price managerial performance and permit easy accumulation of stock by control arbitrageurs.

The shareholder criterion is of course controversial because of the arguable distributional and socio-political implications. For example, in the case of adjustment costs associated with economic change, managers operating under the shareholder criterion would attempt to shift those costs to other potential claimants, or stakeholders, in the firm, in particular the employees. This makes employees bearers of certain kinds of economic risks that some argue are more appropriately borne by firms, or, in the alternative, puts pressure on governments to bear economic risk that might otherwise be borne by firms. An efficiency adherent might argue that the owners of firms can diversify risk better than employees, or that government risk-bearing reduces the incentives for firms and employees to work together to mitigate adjustment costs. A fairness adherent might argue that owners of firms or taxpayers generally in a redistributive tax system are economically better situated to bear these adjustment costs than employees.

A central current debate in international political economy is whether the governance of large private economic organizations will (and should) converge on a model of "shareholder capitalism" substantially based on the shareholder criterion. Under a regime of free capital flows and a reasonably open corporate control markets, it is argued, the shareholder criterion will come to dominate corporate governance because of pressure by equity suppliers to maximize returns. This is a first order proposition because of the way in which particular national systems of social insurance and taxation are linked to assumptions about the extent to which economic risks are distributed between shareholders and employees. Assuming a constant level of social risk aversion, the move to a shareholder-focused governance regime will create pressure on domestic political economy because of the increased risk that employees now face.

Normatively the most attractive basis for the shareholder criterion is the claim that it increases the value of the firm overall, at least ex ante, meaning that there will be more surplus to be divided among the potential claimants. This means that the problem of distribution is potentially solvable through appropriate insurance, rather than inherently divisive. In a sense the shareholder criterion follows almost tautologically from the neoclassical theory of the firm, in which the shareholders are "residual" claimant, meaning they receive a return only after all other participants in the firm are paid off. On this view, if managers are faithful agents of shareholders, they will continue to add productive inputs, including labor, up to the point that the last increment of productive input equals the last increment of additional profit. This will necessarily maximize the value of the firm and the equity as well. This view implicitly assumes that productive inputs other than equity can be obtained on spot markets or under arrangements in which payoffs can be contractually specified. If the world is otherwise — if other participants in the firm make firm specific investments that can be drastically devalued by management's strategic decisions — then it does not follow that maximizing shareholder claims will necessarily increase the value of the firm, taking into account the losses of other participants. Indeed, shareholder gains could come substantially at the expense of stakeholder losses.

Nevertheless it may turn out as a matter of fact that firms operating under a shareholder criterion do produce gains that outweigh the losses. This is the central claim of most supporters of the shareholder criterion. Even if for a particular firm, the gains are distributed for the benefit of shareholders, local political economy could divert at least some of those gains to fund more generous social insurance arrangements that would cover stakeholder losses. But this kind of reasoning (which corresponds to the "Kaldor-Hicks" criterion of welfare economics) is itself controversial, because the mere fact of a bigger pie does not imply larger slices for all participants. Moreover, some participants may suffer losses that are not readily compensable, including demoralization losses and relocation losses. The attractiveness of the "bigger pie" argument, however, rests substantially on the empirical claim that the shareholder criterion will create the bigger pie. Thus if the shareholder criterion is not necessarily justified by evidence that it maximizes total firm value, it is undercut by evidence that it may not.

The goal of this paper is to shed light on that question by a test of the empirical proposition that the shareholder criterion maximizes total firm value, using data drawn from the airline industry in the post-deregulation years 1978-1996. It is, of course, impossible, to test the hypothesis directly in the sense that managerial motives are not directly observable. So the test is at best indirect: whether managers who are most successful in increasing shareholder value are also most successful at increasing total firm value.

Part I provides an introduction to the airline industry, Part II offers an account of "total value of the firm, Part III explains how the data was gathered, Part IV presents data on airline industry trends, Part V discusses the "redistribution hypothesis," part VI presents preliminary data on firm-specific results, and part VII concludes.

I -- An airline industry case study

The airline industry is an informative case study because it offers a sample of firms that faced an abrupt regime shift and whose managers faced choices over the period over how vigorously to pursue shareholder value maximization even if the effect was to impose adjustment costs on other stakeholders, especially the employees. The airline industry is also subject to unique disclosure requirements that make it possible to calculate total firm value in way that includes a measure of labor value. Thus it is possible to ask whether firms that maximized shareholder value over the period did in fact maximize total firm value, both cross-sectionally and in a panel study.

More should be said about the change in the airlines' economic environment.[1] Under the

---

[1] For elaboration, see, e.g., Jeffrey N. Gordon, Employee Stock Ownership As a Transitional Device: The Case of the Airline Industry, in Darryl Jenkins, ed., HANDBOOK OF AIRLINE ECONOMICS (McGraw-Hill

regime of regulated competition that existed from the 1930s to 1978, the major airlines were virtually guaranteed a profit. Airlines had protected entitlements to routes, entry by competitors was limited, and airline fares were set by administrative action to insure profitability. The airlines were also heavily unionized (on the AFL/craft-based model) with few exceptions. Although labor relations were not necessarily harmonious, industry-pattern wage increases and the costs of industry-standard work rules were passed on to consumers through the regulated rate mechanism. Controlling, much less reducing, labor costs was not a critical element for airline survival or expansion. None of the original trunk carriers assigned routes in the 1930s had gone out of business in the ensuing 40 years.

Deregulation abruptly changed the competitive environment. New carriers were free to enter. Routes were no longer protected from competition and fares were no longer subject to administrative control. Incumbent faced competition from two sources: first, from startup carriers with lower cost structures, either because the workforce was nonunion or because union-management relations were not encrusted with the history of operation under regulation, and second, from existing carriers seeking to expand their route structures. Operations decisions suddenly affected not only relative profitability but also survival of the carrier. This was vividly demonstrated of the course of the 1980s as a number of well-established incumbent, including Braniff, Eastern, and Pan American, fell into severe financial distress, went through unsuccessful reorganizations, and, in extreme cases, were eventually liquidated. Thus airline managers faced a treacherous environment of sharp competitive pressures that puts a spotlight on how the adjustment costs, or transition costs, problem was addressed. Kole & Lehn document the evolution of governance structures in the airline industry, in, which among other changes, equity ownership becomes more concentrated, outside blocks become more common, stock option grants to chief executive officers increase, and CEO turnover becomes more frequent.[2] These monitoring and incentive alignment enhancements would be expected to lead to strategies that emphasize shareholder value. These changes underline the relevance of the question of whether the airlines that were most successful in maximizing shareholder value were also most successful in maximizing total firm value.

II – "Total Value of the Firm"

Recall that the question is whether managers who maximize shareholder value maximize the "total value" of the firm. I define the "total value" of the firm to include the claims of other participants within the boundary of the firm who have also made firm specific investments, namely, the debtholders and the employees. Academic lawyers most commonly associate the value of the firm with shareholder value, in particular, the market capitalization of the firm: the

1995); Jeffrey N. Gordon, Employee Stock Ownership in Economic Transitions: The Case of United Air Lines, in Margaret B. Blair and Mark J. Roe, eds.., Employees & corporate Governance 317 (1999).

[2] Stacey R. Kole & Kenneth M. Lehn, Dereuglation and Adaptation of Governance Structure: The Case of the U.S. Airline Industry, 52 J. Finan. Econ. 79 (1999).

number of shares outstanding times the share price.[3] Economists are apparently ambivalent. Although financial economists who use event study methodology to evaluate transactions seem to embrace a shareholder measure, in general economists understand that the value of the firm should include debt claims. This follows from the Modigliani-Miller irrelevance hypothesis that the value of the firm should be independent of its capital structure. Valuation measures such as Tobin's q include debt as well as equity, and financial economists would probably defend the exclusion of debt measures in their event studies on the practical ground that in most case, debt is a relatively small proportion of firm value and its value would not change very much in most transactions.

The controversial claim is to include a measure of "employee value" or "labor value." Although it may be hard to generate an appropriate measure, that such a labor value exists seems to follow from the now conventional ideas in labor economics about firm specific human capital investments. Part of employee compensation is return on employee investment in firm specific human capital. This can include a skill set tailored to the employer and time spent developing a reputation for a certain capability, the employee share of so-called "match-specific" assets. These employee investments are similar to shareholder and debtholder investments in the sense that they are sunk. They represent investments in the firm that are at risk should the firm liquidate. If the firm were to liquidate, these investments would be wiped out (or substantially diminished). This has implications for the measurement of "labor value." The measurement should not be based on the firm's total wage bill, because a laid-off employee can obtain employment elsewhere at a positive wage reflecting general human capital investment. Rather, "labor value" should be measured in terms of the difference between the employee's present wage and his/her outside option, or opportunity wage. I called this the employee's "rents and quasi-rents," a perhaps idiosyncratic usage, to reflect both the employee share of the firms's rents (if any) that derive from its market position, and quasi-rents, which conventionally connects to employee human capital.

One possible objection to including "labor value" in the value of the firm is that in a competitive market, "labor" is simply an input, a cost of production like a machine (which may substitute for labor), supplied on spot market or contractual terms. But on this view, why should "debt value" be included in the value of the firm? Debt fits the market model better than labor: there is a spot market for debt and the contractual terms may be well specified. Another objection would liken the employee to a supplier of labor. Like many suppliers making firm specific investments, the employee must solve a contracting problem with the employer over appropriable quasi-rents, but those rents ought not be included in the "value of the firm." (Another version of this objection is, to include employees you must include other suppliers). Coase and Williamson provide answers. The boundaries of the firm mark a significant difference in the level of firm-specific investment, so supplier rents should not be included in the value of the firm. Employees, moreover, are controlled in a hierarchical fashion, not through markets,

[3] Not all agree. See, e.g, Lynn Stout, Stock Prices and Social Wealth, Working Paper, Nov. 2000.

and thus should be regarded as "within" the firm.[4] In the usual case, they are not genuinely "suppliers" of labor services.

Another possible objection is to the inclusion of "rents" – meaning the employee share of the firm's supracompetitive return – in labor value, on the normative ground that concern about protecting human capital investments should not extend so far. Put aside for the moment the difficult measurement problems this would create. The objection may have particular force in the airline industry, where the legacy of regulation may have left the employees with significant rents. First, as a general matter, although the matter is contested empirically, there is good evidence that profitability and wages are associated.[5] The protected profit position of the airlines under regulation should thus have led to higher employee wages.[6] Empirical evidence on the decline in employee wages in the airline industry supports this view. For example, Card (1989, 1996)[7] estimates that the skill-adjusted earnings of airline employees fell by 9 percent over the 10 years following deregulation. Hirsch & MacPherson (1994)[8] estimates a decline of 17 percent in skilled-adjusted earnings of airline employees over the 1978-1993 period. These studies thus suggest that before deregulation airline employees were earning a premium relative to employees of comparable skill, thus suggesting that their wages were in part attributable to industry rents.

This seems not a good objection to including "rents" in "labor value" for the simple reason that we include "rents" in shareholder value. As Warren Buffett famously reminds us, the goal of all business is to create a "moat around sustainable competitive advantage," which is

---

[4] A related objection that is this measure fails to take account of direct substitutes for labor through outsourcing, i.e., that it underestimates labor value and thus total firm value. First, the fact of outsourcing (only some tasks are outsourced) marks a difference in firm specific investment. Second, even if such outsourcing reduced labor value (because it reduces total employment) it would probably raise shareholder value and thus would reflect changes within the firm.

Another objection is that my definition of the value of the firm is too narrow because it doesn't take account of customers. If the firm provides goods and services in a competitive market, then firm-specific "customer rents" will be small because customers will be able to shift to alternative suppliers. Ironically the airlines may be an industry where that customary assumption may not apply. In light of the difficulty operationalizing "labor value," expanding the circle to include "customer value" must wait.

[5] See David G. Blanchflower et al, Wages, Profits, and Rent Sharing, 111 Q. J. Econ. 227 (1996); Anrew K.G. Hildreth & Andrew J. Oswlad, Rent Sharing and Wages: Evidence from Company and Establishemnt Panels, 15 J. Lab. Econ. 318 (1997); Lawrence F. Katz & Lawrence H. Summer, Industry Rents: Theory and Evidence, Brookings Papers on Economic Activity (Microeconomics) 209 (1989)

[6] See Armen A. Alchin & Ruben A. Kessel, Competition, Monopoly, and the Pursuit of Money in Aspects of labor Economics 157-83 (1962).

[7] See David Card, Deregulation and Labor Earnings in the Airline Industry, in James Peoples, ed., Regulatory Reform and Labor Markets (1997) (citing earlier work).

[8] Barry Hirsch & David MacPherson, Labor Earnings, Rents, and Competition in the Airline Industry, 1973-1993, – J. Labor Econ. – (1994).

to say, to market power that allows the firm to generate economic profits. In assessing Microsoft, we don't exclude from the shareholder value calculation that portion of profits that might be attributable to "rents." If Microsoft loses its competitive advantage and its stock price falls, by common consensus there is a diminution in the value of the firm, measured in terms of shareholder value (even if there may be a corresponding increase in consumer surplus). Similar reasoning should apply in the assessment of labor value as a component of total firm value.

Thus I define "total firm value" as equal to the sum of "equity value", "debt holder value" and "labor value."

(1) $$T = E + D + L$$

I also define another variable, shareholder return, S, equal to stock price changes and regular and special dividends on a per share basis.[9] The broad question is whether managers who do best to maximize S also do best to maximize T, or somewhat differently, for managers that do best to maximize T, what is the pattern of stakeholder maximization.

III – Gathering the Data

We gathered data on capital structure and labor costs for 9 major trunk carriers that were in existence at the time of deregulation and one major carrier, Southwest, that entered shortly thereafter.[10] This preliminary paper covers the 1978-1994 period, but eventually the study will cover the period through 1997. Some of these carriers went through complicated reorganizations, including mergers, spinoffs, and trips through bankruptcy court. We try to make appropriate adjustments for changes. Two carriers, Pan Am and Eastern, do not survive through the period.

The variable "E" is the firm's equity value, measured at yearend, for the years 1978-1994, calculated as the number of shares outstanding times the stock price. The covered airlines were public companies during most of the period and so we generally used annual reports and standard sources such as such as Compustat.. (Certain issues of preferred stock do not trade frequently and thus some estimate of their value was required, based on book valuations, comparisons to traded issues, and the firm's credit rating. Preferred stock is not a significant percentage of airline capitalization.)

"D," debtholder value, is defined as the market value of an airline's outstanding debt (not book value, since airline credit risks sharply increased in the period and since many airlines

[9] The variable "E" is in a sense "shareholder value," but the shareholder wealth maximization norm is really the injunction to maximize the stock price. Usually changes in E will be closely correlated with S, but not necessarily. The issuance of new shares (or the repurchase of existing shares), ay well affect E and S differently.

[10] The set consists of: American, Continental, Delta, Eastern, Northwest, Pan Am, Southwest, TWA, United, and USAir.

substantially increased leverage). Airline capital structure is complex because airlines are financed through a combination of bank debt, publicly traded debt securities, and leases, some of which are not included in the balance sheet. Using the annual reports for the covered airlines over the period 1976-1994, we created a data base of these values. The value of publicly-traded debt is reported on Compustat. For bank debt and non-publicly traded debt securities, we estimated the value based on an appropriate changes to reported book value, taking account of changes in general interest rates and the airline's credit rating. For capital leases, which are reported on the balance sheet, we used book value (adjusted, as in the case of debt, for credit rating changes). For operating leases, we used the so-called "S&P" method, which estimates the discounted present value of the lease payments, based on footnote descriptions. In 1992, accounting standards changed to require companies to report the fair market value of balance sheet items. This makes the post-1992 data easier to assemble. Pre-1992 data was generated using the same assumptions companies are supposed to follow post-1992.

As noted above, L, "labor value," is defined as employee rents and quasi-rents, meaning the discounted present value of the difference between the employees' wage stream if employed at a particular airline and the next best alternative. Thus it would not be correct to define L simply as the discounted present value of wages, because the comparable variable is labor *investment*. For example, in the case of firm that paid employees spot market wages, L would be 0 because upon liquidation of the firm employees could readily switch to a job that paid an equal amount. Similarly, L would be lower in a firm where employees received general training than in a firm where training developed firm specific human capital.

We considered three possible ways of computing L. First, it would be possible to assume that airline employees, like other longterm employees studied in the labor economics literature, take a paycut of a fixed average amount; amounts from 15% to 30% are reported. This mutes differences across employee groups and across time, however.

Second, it would be possible to use direct evidence based on the biannual "Displaced Worker Survey" done by the US Census Bureau (as part of the Current Population Survey) since 1984. For the subset of surveyed workers leaving the airline industry, it is possible to determine the original wage and the wage at the next job. Although this data set shows substantial wage losses, there are several problems with it, including: (i) The number of airline workers in any specific category in an biannual survey are too small for statistical significance; aggregating workers over successive surveys loses differences over time. (ii) The data is "top-coded," meaning that losses of high-income employees (pilots) are not adequately represented because salaries above the top level (typically $100,000) are not differentiated. (iii) The survey covers the entire aviation sector, not limited to scheduled carriers, and thus distorts the results. (iv) Because of the seniority structure of job ladders for the scheduled carriers, it is very unlikely that workers with the highest salaries (and largest potential losses) would have been adequately represented in the survey. (v) Finally, the surveys began only in 1984, meaning that a number of important early years would be lost.

A third approach, which is the basis for the results reported in this paper, uses detailed disclosure of wages and employment data that is unique to the airline industry. First, as a legacy of regulation, airlines are required to disclose annual operational and financial data to the U.S. Department of Transportation, including employee wages and benefits broken down into several occupational categories, on so-called "Form 41." We obtained Form 41 data from commercial data base services and airline consulting firms. Second, airline labor relations are governed by the Railway Labor Act, which requires deposit of contracts with the Federal Mediation Board in Washington, D.C. From the contract terms, it is possible to compute wage levels by job category for each airline in each year. We obtained summaries of this information for several years for most carriers from industry sources. For other years we examined the contracts and did the computation directly.

In addition to contract data, to compute L it is necessary to estimate average tenure data for each employee group at each airline. For example, high tenure employees will be further up the salary ladder and have more to lose upon job switching. On the other hand, such employees will have fewer remaining years in the workforce and their losses will be less than an equivalently-compensated employee of less tenure. For tenure data through 1990 we relied upon Cremieux (1996) and thereafter, on a running of his computer model with more recent data.[11] .

In computing L, we also relied on two important characteristics of employment in the airline industry. First, most airlines strictly enforce seniority-based job ladders, meaning that if airline A goes out of business, its most senior pilots would have to start at the bottom of the ladder at airline B if they wanted to remain a commercial pilot. Second, the opportunity wage, or "outside option," of an airline employee will be a similar job at another airline; this is likeliest to preserve industry-specific capital.[12] However, because of the rigid nature of the tenure ladder, this opportunity wage is based on the average entry level for the job category in question. We used the average entry level wage for the job category in question (average across all airlines) rather than the lowest entry level wage (ie, the wage level that is most effected by competitive labor markets). This will reduce the level of rents and quasi-rents at risk, that is, biasing against overstating L. Thus L for a particular airline in a particular year equals the sum, for all job classifications, of the discounted present value of the difference in wage streams of the actual wage minus the entry level wage, for an average-tenured employee in a particular classification times the number of classification employees.[13] The discount rate used in the present value

---

[11] Pierre-Yves Cremieux, The Effect of Deregulation on Employee Earnings: Pilots, Flight Attendants, and Mechanics, 1959-1992, 49 Ind. & Lab. Rel. Review 223 (1996). Cremieux generously made available his unpublished data files and computer programs. This version of the paper, which stops at 1994, estimates tenure based on his 1990 results.

[12] It also gives effect to the fact that our computation is based on wages, not benefits, which have traditionally been well above general averages. We do not otherwise take account of benefits.

[13] In effect we construct a tenure slope for each job classification, each firm, each year, based on lowest and highest wages for the job classification in question from the contract data referred to above. We then compute average tenure per job classification, firm, and year. On the assumption of a typical 30 year career, average tenure will then correspond to a particular point on the tenure slope and thus a tenure-adjusted average wage. The calculation of rents and quasi rents is based on the loss of dropping from that wage to the industry average entry level wage for that job classification, in effect assuming a parallel tenure slope in the

computation is the particular airline's interest rate on long term debt, on the notion that labor value should take account of the riskiness of the current wage stream. Changes in the airline's creditworthiness will thus reduce labor value in the same way that it reduces the value of other fixed payment obligations, namely, debt. The computation of labor value for firm j for year t is given by:

$$(2)\qquad L_{jt} = \sum_{j}\left[\frac{\left(w(a)_{jit} - w(e)_{jt}\right)\left(N_{jit}\right)\left(30 - a_{jit}\right)}{\left(1 + r_{it}\right)^{30 - a_{jit}}}\right]$$

Note:

Where $w(a)_{jit}$ is the wage of an employee of average tenure in job classification ***j*** at firm ***i*** in year ***t***, $w(e)_{jt}$ is the industry average entry level wage for job classification ***j*** in year ***t***, N_{jit} is the number of employees in job classification ***j*** for firm ***i*** in year ***t***, r_{it} is the discount rate on the long term debt of firm ***i*** in year ***t*** and $30 - a_{jit}$ is the expected remaining career of an employee.

new job. Rents and quasi-rents will thus be a function of the wage drop and the remaining career period. So senior employees at the top of the tenure ladder with very high wages have at lot at risk for any given year, but not necessarily as much, in the aggregate, as less senior employees with a long career ahead.

The computation in the case of pilots required additional adjustments. Pilot wage increases depend upon promotion to a better job or a bigger plane. That is, the tenure ladder for any particular pilot job is essentially flat. A pilot who spends a career as a first officer in a Boeing 737 will see very little wage growth. Pilots obtain substantial increases upon a move from a smaller to a bigger plane, and from a first officer job to a captain's job. A captain of the smallest plane is paid more than a first officer of the biggest plane. So the pilot's tenure ladder is constructed on the basis of first officer's wage at the smallest plane in the airline's fleet at the low end and a captain's wage at the largest plane at the high end.

Because pilot wages are such an important element in airline finance, we make a furher adjustment in the shape of the tenure ladder. The tilt of the ladder will depend upon the growth of the airline. Pilots of an airline that experiences rapid growth will receive rapid wages; the tenure ladder is very steep. By contrast, the tenure ladder at a slow-growing airline will be flatter. As a direct measure for growth, we gather data on fleet size and composition for each airline for each year from annual reports, 10Ks, and industry publications. We weight changes in fleet size and composition equally in computing the degree of positive or negative tilt to the tenure curve.

IV -- Some Airline Industry Trends

Two of the remarkable features of the airline industry in the post-deregulation period are first, the extent to which debt represents an increasing large share of the total value of the firms in the industry, and second, the relative flatness of the labor share, in absolute and percentage terms. These trend are illustrated in the graphs that follow.

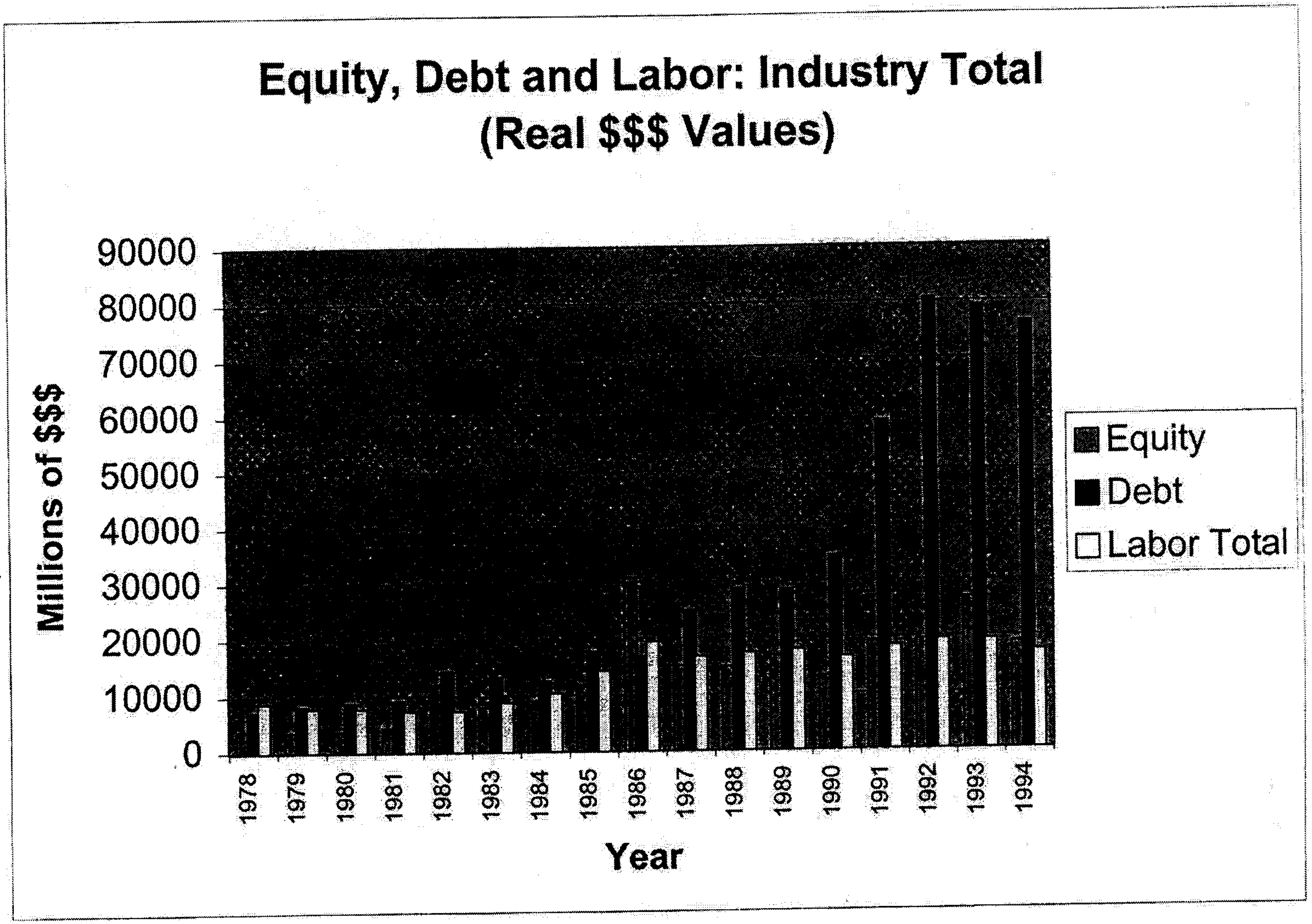
Graph 1 provides an overview of industry aggregates (in $1994). It shows an industry that grew relatively slowly in the early 1980's but grew at an increasing rate beginning in the mid-1980s. Much of the growth of the value of the industry is represented through substantial additions to industry debt. The slowest growing component was the labor share. Adding the columns, industry total firm value grew (in real dollars) from less than $25 billion in 1978 to $115 billion in 1994, approximately 550%. The equity interest grew from approximately $5 billion to $20 billion, 400%. Remarkably, the debt interest grew from approximately $8 billion to $75 billion, almost 950%. By contrast, the labor interest grew from $10 billion to approximately $18 billion, less than 100%.

This story is also illustrated in graph 2, which shows the relative growth of equity, debt, and labor components of total firm value, based on an equally-weighted index of firms in the sample. Because of the muted presence of larger firms in the equally-weighted presentation, labor appears to be growing almost as rapidly as equity, but the slowest growing component, essentially unchanged after 1986, is the labor share.

The change in industry valuation structure is emphasized by graph 3 and graph 4, which illustrate the changing composition of total firm value. Labor value is a steadily decreasing portion of total firm value, declining from nearly 40% to less than 20%. Equity remains the same, approximately 20%. Debt, by contrast, virtually doubles its share, from less than 30% to more than 60%.

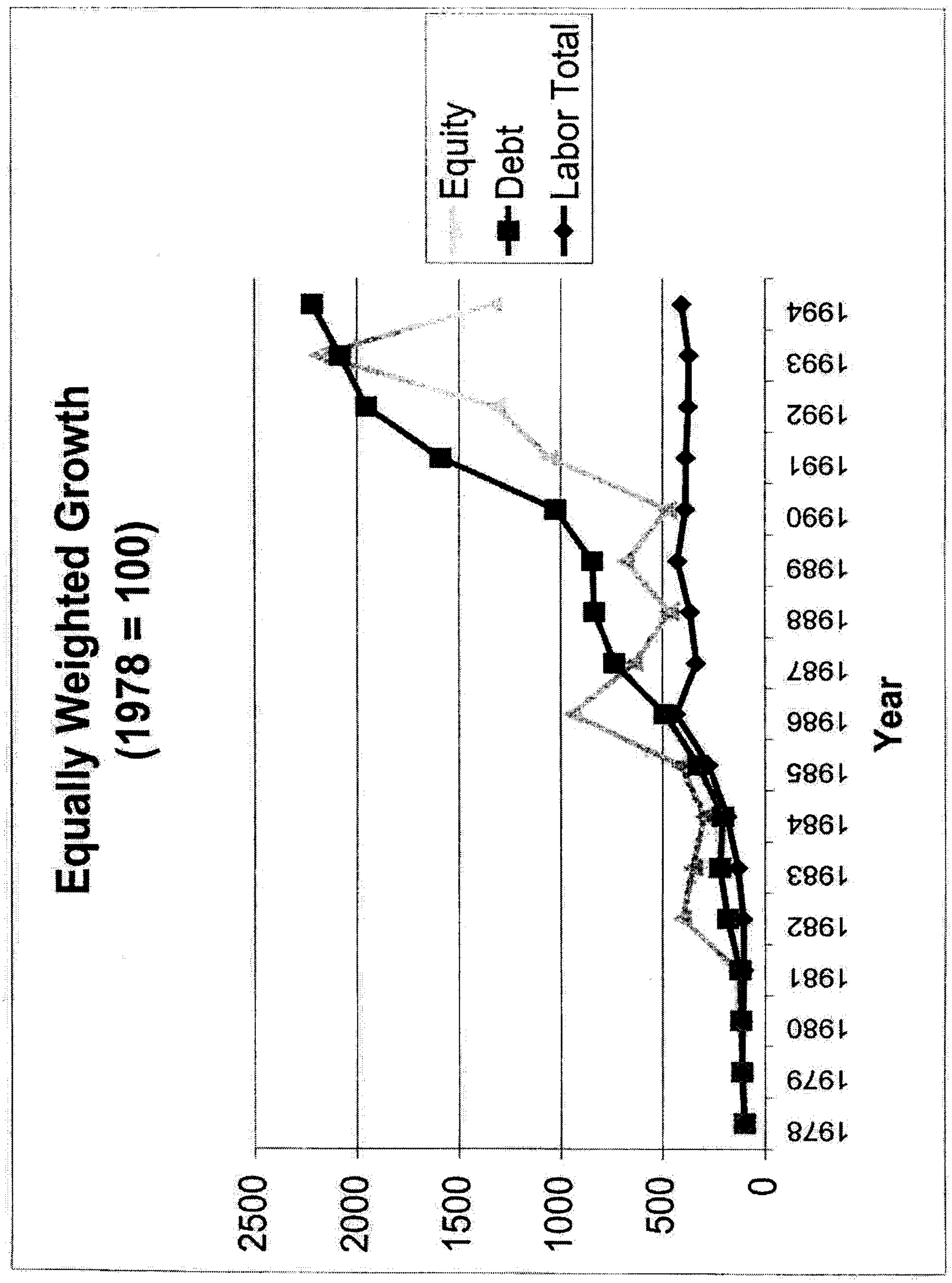
[Graphs 1-4 should be inserted here.]

Graph 1



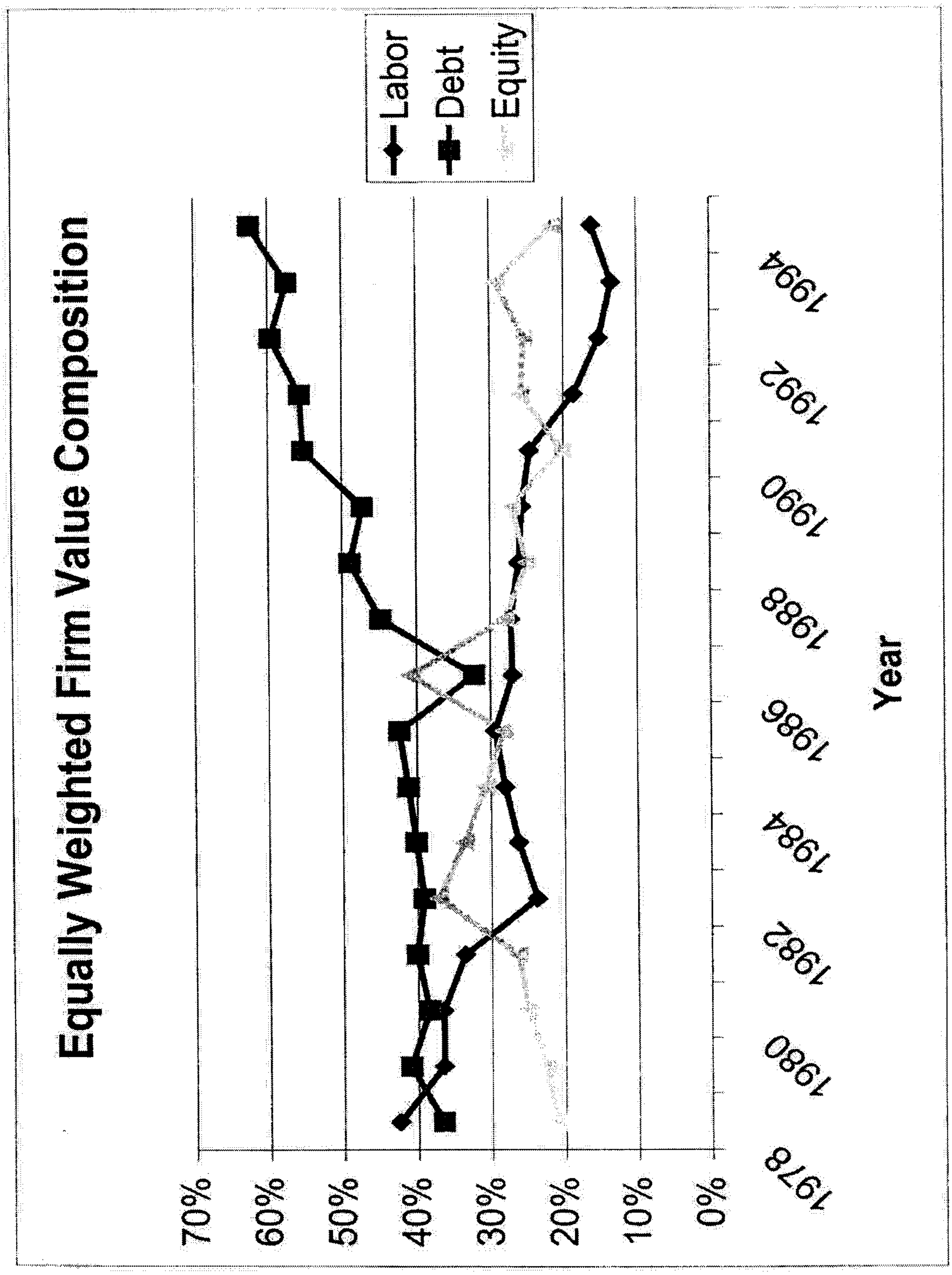
Equity, Debt and Labor: Industry Total
(Real $$$ Values)
Millions of $$$
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
Year
Equity
Debt
Labor Total

Graph 2



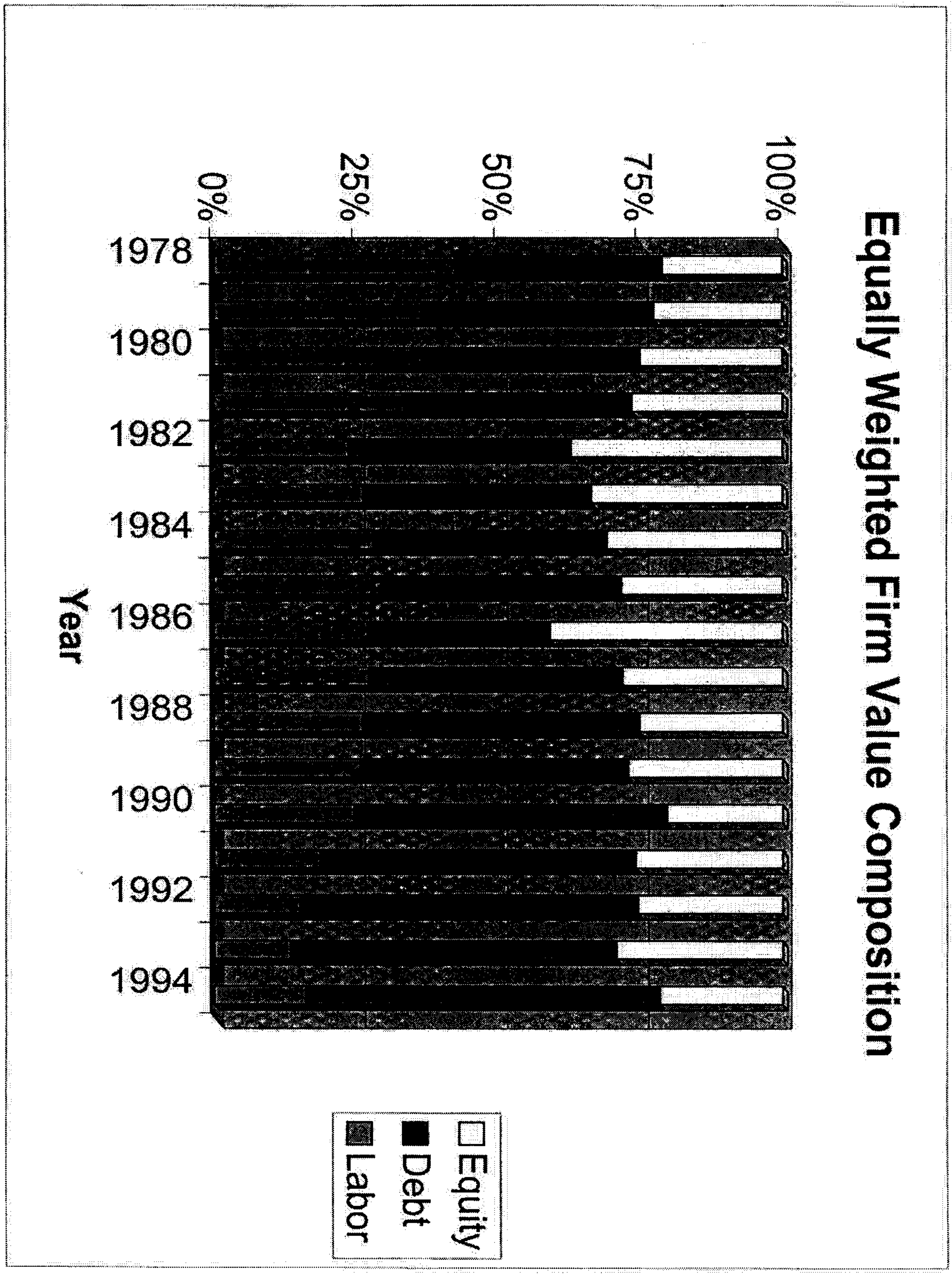
Equally Weighted Growth
(1978 = 100)
Equity
Debt
Labor Total
2500
2000
1500
1000
500
0
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
Year

Graph 3



Equally Weighted Firm Value Composition
Labor
Debt
Equity
70%
60%
50%
40%
30%
20%
10%
0%
1978
1980
1982
1984
1986
1988
1990
1992
1994
Year

Graph 4



Equally Weighted Firm Value Composition
0%
25%
50%
75%
100%
1978
1980
1982
1984
1986
1988
1990
1992
1994
Year
Equity
Debt
Labor

V – The Redistribution Hypothesis

This airline industry data lets us explore one of the more controversial hypotheses associated with corporate restructurings and takeovers: that the purpose and effect of such transactions is to shift value from stakeholders, particularly employees, to shareholders. This proposition is most famously presented by Shleifer & Summers in an account of Carl Icahn's takeover of an airline, TWA, in 1985, through a leveraged buyout.[14] On Shleifer and Summers' account, Icahn was able to use the disciplinary power of debt to force significant wage cuts on TWA employees, only partially offset by stock that the employees received in return. They estimate the transfer from employees at $600 million and the premium received by shareholders between $300 and $400 million, thus suggesting that the transaction reduced total firm value.

A similar story might be told about the airline industry aggregate. As graphs 1-3 illustrate, until 1986 the labor component of firm value was increasing at roughly the same rate as the other components. Things changed in 1986 – there is a kink in the curve. Thereafter, labor value growth is relatively flat, lower than other components. The explanatory variable is the introduction of increasing amounts of leverage into airline capital structures. The hypothesis is that airline managers were able to use the disciplinary power of debt to reduce wages, to knock down rents and quasi-rents. On this view, airline managers (including but not limited to control entrepreneurs like Icahn) realized that the riskiness of leverage in a business with high variance cash flows could be a boon. As cash flow threatened to fall below debt service, employees, faced with the very unpleasant alternative of an airline bankruptcy, could be induced to reduce their wages. Some rents and quasi-rents are better than none. This value could be captured for the shareholders, another version of the redistribution hypothesis.

The airline industry data, however, suggests an alternative hypothesis, the growth hypothesis, to explain the introduction of leverage in airline capital structure and indeed, perhaps to explain why Shleifer and Summers might be right about TWA. Airline economics and the bargaining endowments for employees under the Railway Labor Act give airline employees an especially good bargaining position. Operating leverage is high in the airline industry, meaning that fixed costs are high, variable costs low, and changes in revenues go right to the bottom line. Relatively small reductions in the airline's ability to fly a full schedule at customary efficiency quickly affect earnings. In this environment it would be difficult to persuade a capital supplier to contribute equity to buy new planes. The risks of expropriation are just too high.[15] One solution to this, of course, is for capital to come to the firm in the form of debt. So leverage is not necessarily a mechanism to transfer away value from labor (at least in the aggregate) but to control labor's power to shift cash flows ex post and thus to permit the airline to grow. It may be

---

[14] Andrei Shleifer & Lawrence Summers, Breach of Trust in Hostile Takeovers, in Alan Auerbach, ed, Corporate Takeovers: Causes and Consequences 33 (1988)

[15] Note that the seemingly odd tenure ladder for pilots is a partial contractual solution to this dilemma. That pilot wage increases occur principally through promotion to better jobs in bigger planes gives pilots significant incentive to avoid wage demands that new equity capital suppliers would find expropriative. This incentive is partially undercut by tensions between senior pilots, who already have the highest paying jobs and may have disproportionate influence in the union, and junior pilots (not to mention the would-be pilots who will never be hired).

that debt has a double function: to squeeze out some labor rents for the benefit of shareholders, but even more important, to constrain the growth of labor rents beyond what exists. Thus it would be a mistake to assess "redistribution" in a single period, because it may be that an apparent transfer in one period is part of an adaptation that enables growth that, in subsequent periods, will add more jobs at a substantial wage. Assessing whether the pie is growing (or shrinking) requires a longitudinal take. Indeed, arguably the redistribution hypothesis cannot be fairly assessed with any single firm, because a strategy that generally adds total value to an industry segment may be poorly implemented at a single firm. Alternatively, to take another scenario familiar to the airline industry, a bargaining breakdown that leads to great loss of value at a single firm (Eastern Airlines, for example) can serve as a cautionary, value-creating example for the survivors.

The airline industry offers interesting evidence in support of the growth hypothesis. As noted above, graph 1 shows an industry that has grown quite rapidly since the turn to debt in 1986. Labor value is flat, but total firm value has increased substantially. (Increased labor productivity is hard to obtain in the airline industry, especially for critical employees like pilots. Thus it must be that per-employee rents and quasi-rents have substantially diminished, since the number of employees has obviously increased.) Perhaps equally revealing is the form in which debt capital has entered the industry. As Graph 5 shows, most of the new debt was provided in the form of leases, especially operating leases. In other words, capital suppliers provided planes through a financing device that gave them the greatest chance of rescuing their investment should the airline default[16] and that would minimize employees' hold-up power. The debt was not general credit, but rather was tied to specific additions to capital. In the pre-deregulation days, airlines could buy planes out of equity's share, or perhaps general debt, because the economic protections of the regulated era assured equity of a market rate of return and debt of repayment. That became risky in deregulation. Competition from new entrants and from existing incumbents put pressure on airline cash flows; inevitably shareholders (through their managerial agents) and employees would compete to avoid bearing the adjustment costs. In that environment, lease financing was a safer way to provide capital.

Further evidence on this point is provided through a comparison of the capital structures of American Airlines and Delta Airlines, on the one hand, and Southwest Airlines on the other, in Graphs 6-8. American and Delta, both important trunk carriers since the founding of the airline industry in the 1930s, exhibit the industry pattern of accelerating growth associated with increasing debt, especially capital and operating leases, in the 1980s, and debt increasing as a share of total firm value. Southwest presents a very different picture. Its growth in value is not fueled by an accelerating level of debt; moreover, its increase in lease debt is matched by an increase in general purpose debt in the late 1980s. The key is in the very different labor relations established by Southwest -- a carrier born of the deregulatory era. Apparently Sourthwest has created a system of incentives and a workplace culture that have substantially mitigated the risk of expropriation of capital suppliers. This seems to be the message of its capital structure – and adds further evidence to the "growth hypothesis" explanation for airline industry leveraging.

Finally, it may be that TWA shows that a single point does not determine a line. Graph 9

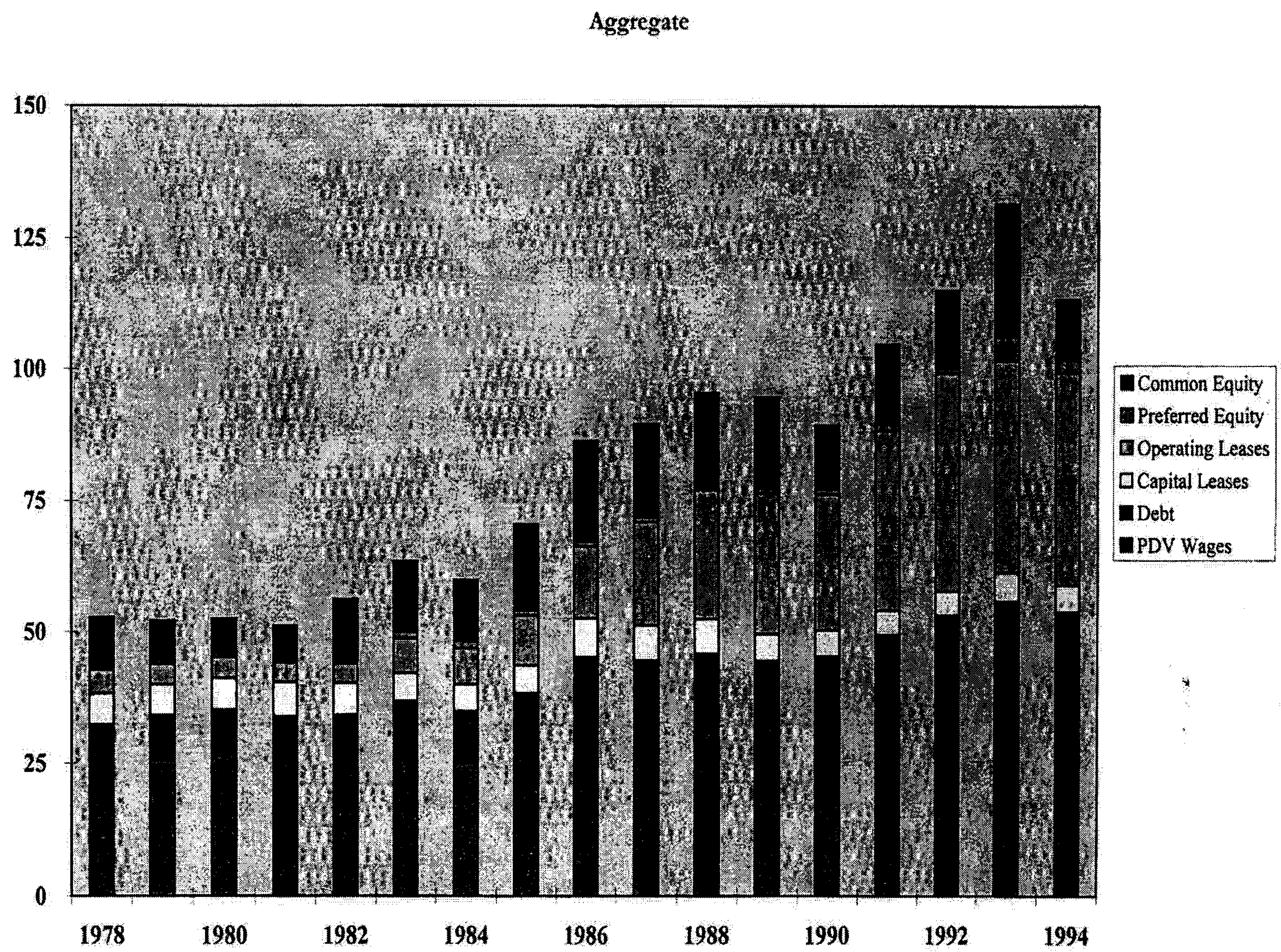
---

[16] The Eastern bankruptcy, in which the Bankruptcy Trustee insisted on keeping the airline afloat until it literally ran out of cash, showed that creditor protection doesn't always work.

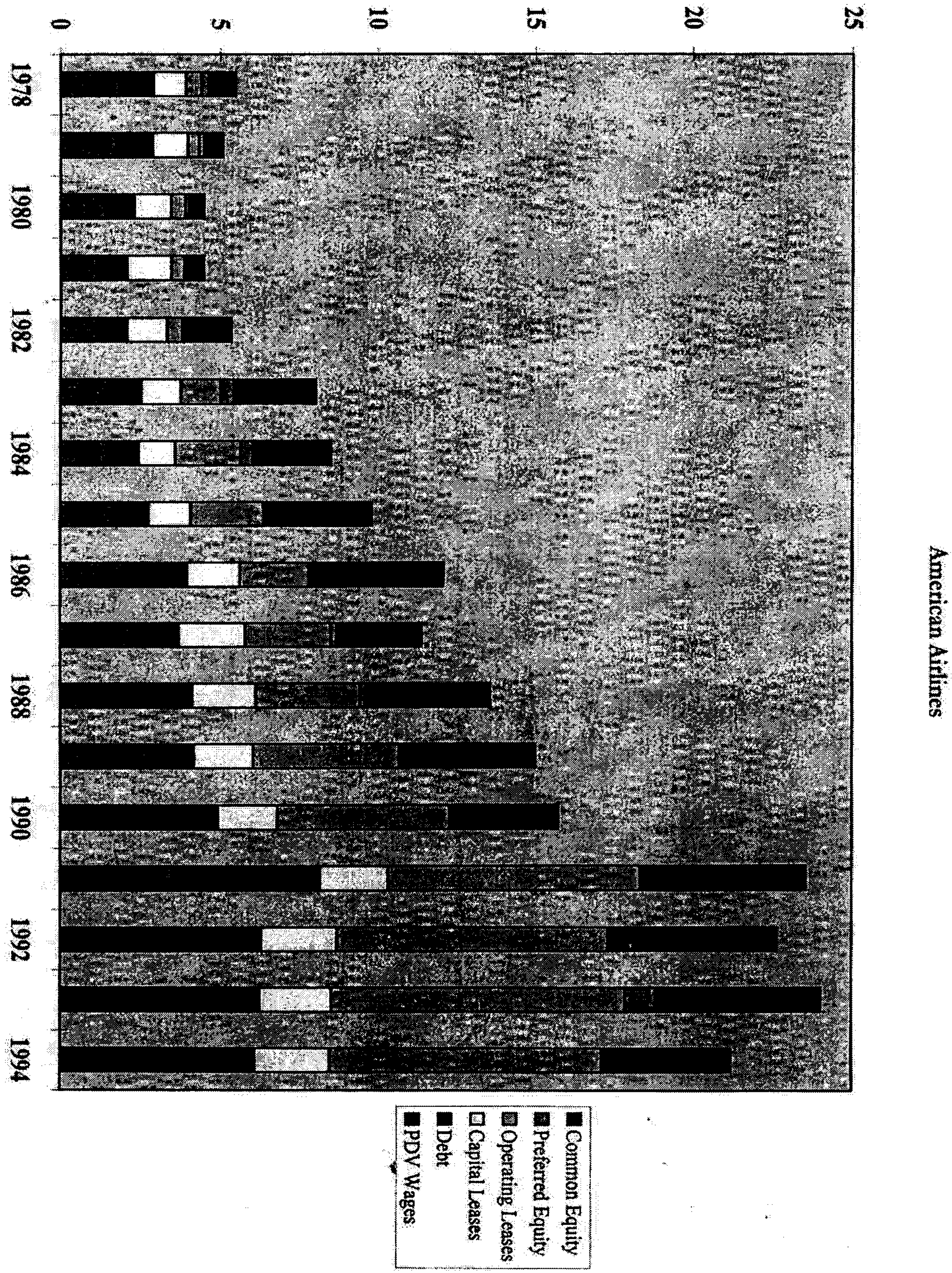
shows that TWA's capital structure was debt-heavy in early deregulation period and that Icahn's leveraged buyout added general debt but not much more debt specifically aimed at the financing of new planes. Icahn's goal in TWA may indeed have been redistributive, and, as TWA's later trips through bankruptcy court illustrate, he did not grow the airline.

[Insert Graphs 5-9 here]

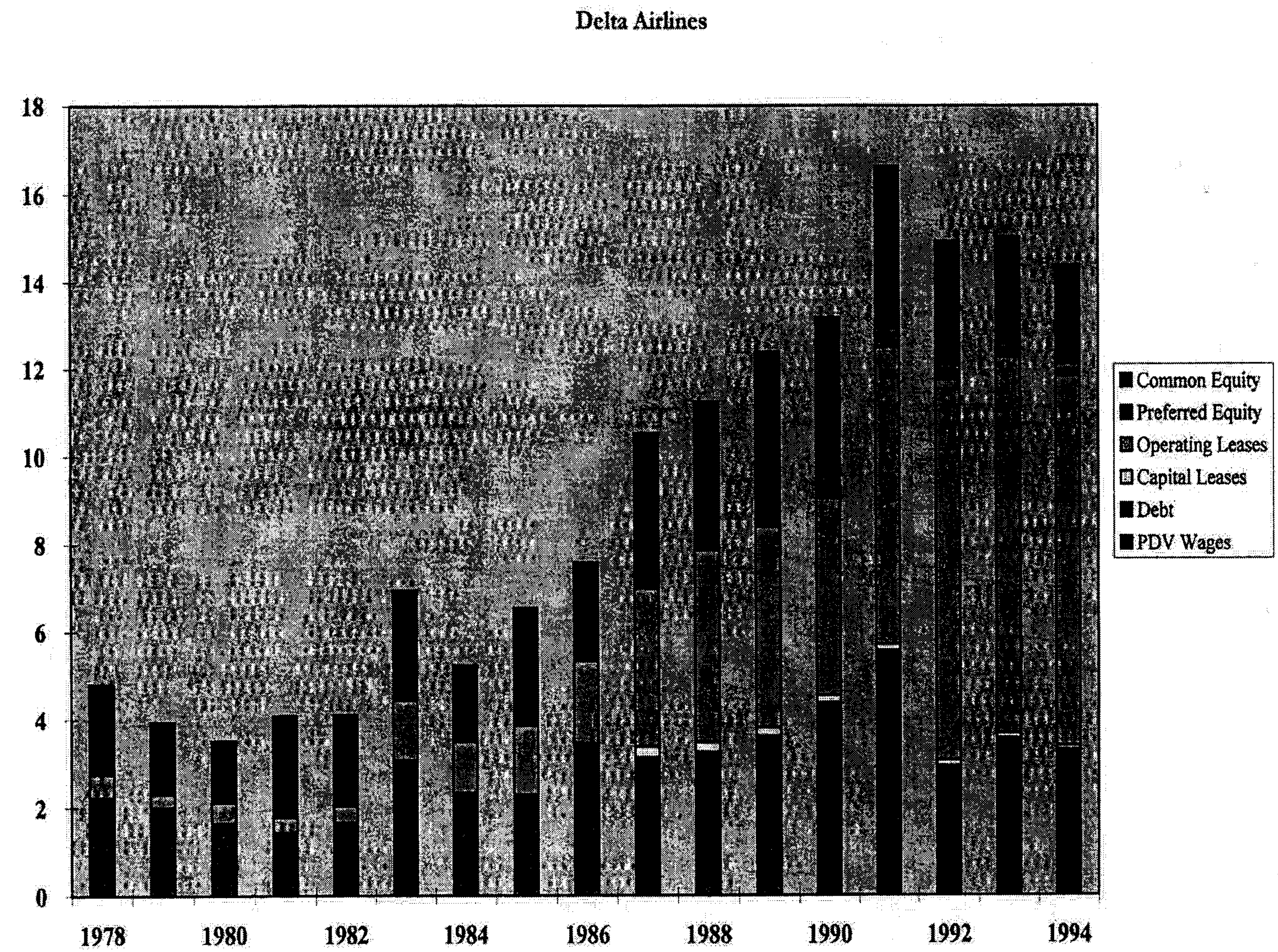
Graph 5


Aggregate
150
125
100
75
50
25
0
1978
1980
1982
1984
1986
1988
1990
1992
1994
Common Equity
Preferred Equity
Operating Leases
Capital Leases
Debt
PDV Wages

Graph 6

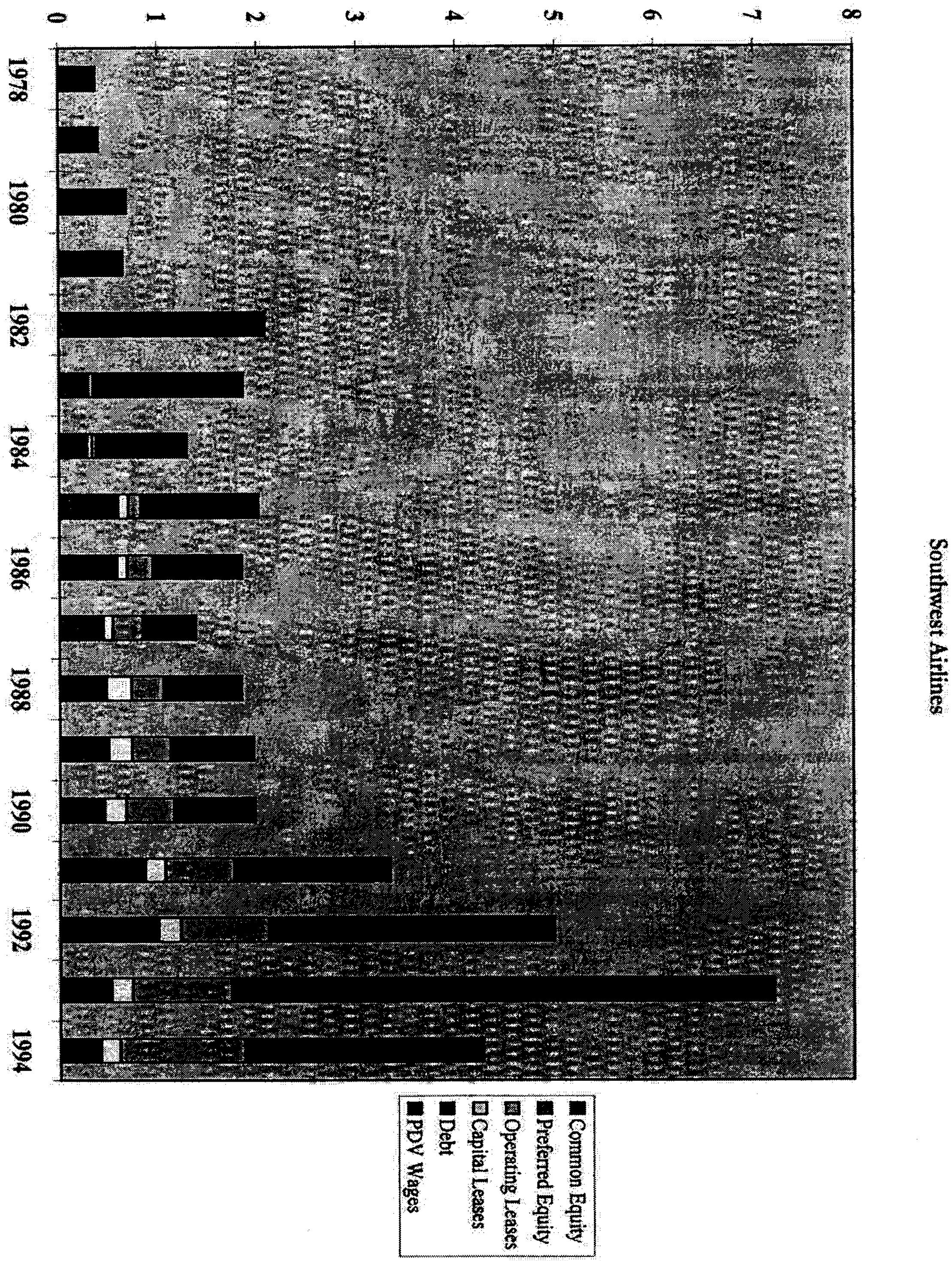

American Airlines
0
5
10
15
20
25
1978
1980
1982
1984
1986
1988
1990
1992
1994
Common Equity
Preferred Equity
Operating Leases
Capital Leases
Debt
PDV Wages

Graph 7



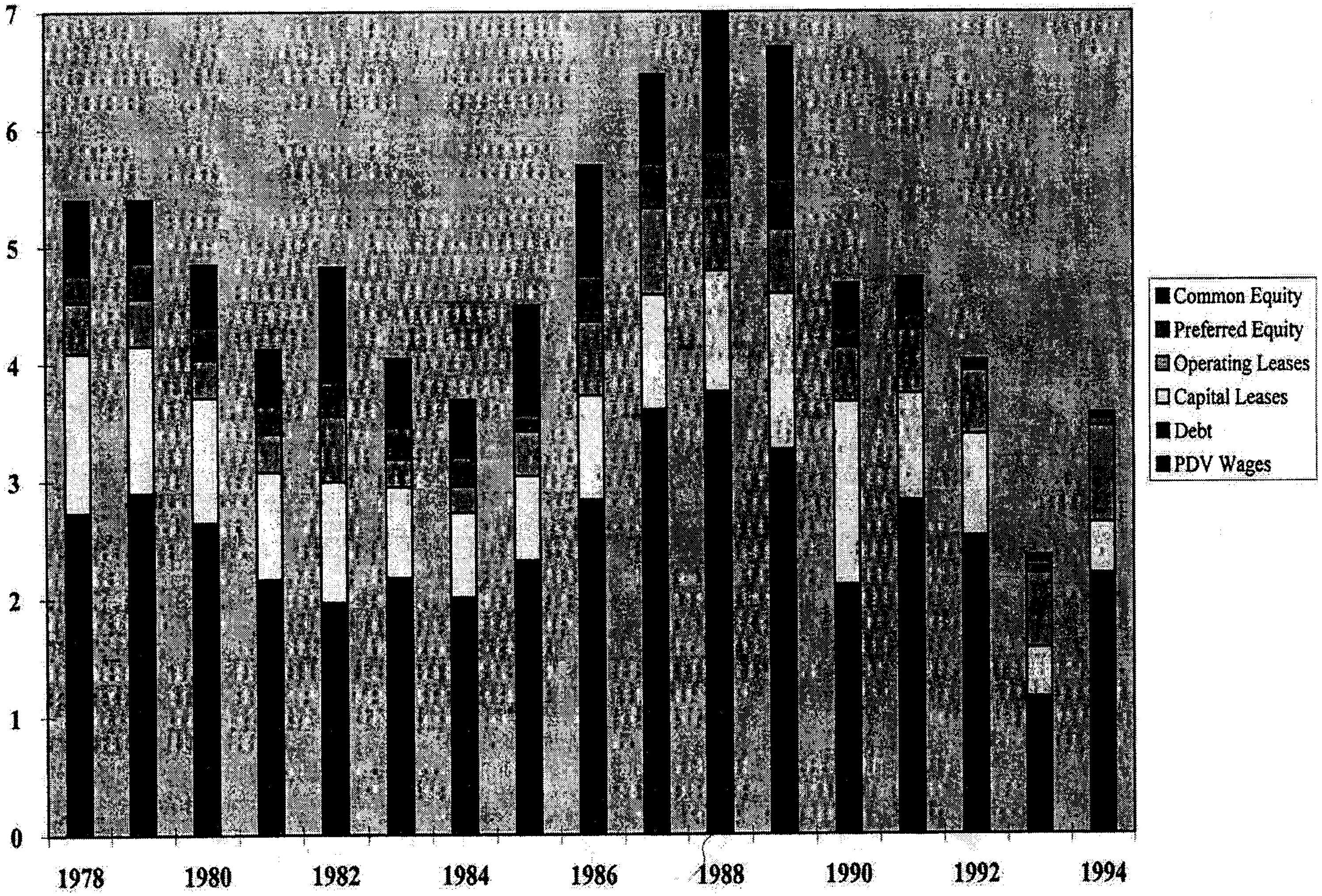
Delta Airlines
18
16
14
12
10
8
6
4
2
0
1978
1980
1982
1984
1986
1988
1990
1992
1994
Common Equity
Preferred Equity
Operating Leases
Capital Leases
Debt
PDV Wages

Graph 8


Southwest Airlines
0
1
2
3
4
5
6
7
8
1978
1980
1982
1984
1986
1988
1990
1992
1994
Common Equity
Preferred Equity
Operating Leases
Capital Leases
Debt
PDV Wages

Graph 9

Trans World Airlines



VII -- Preliminary Data on Firm Specific Results

[This is very sketchy.]

The empirical question of interest is whether mangers who pursue the shareholder wealth maximization criterion will maximize total firm value. We try to shed light on this question by asking whether whether success at increasing shareholder value is associated with success at increasing total firm value. (In later work we will attempt to address this question more directly by using stock option grants to as a proxy for management pursuit of the shareholder criterion, testing whether there is an association between option grants and increased shareholder value, and between option grants and increased total firm value.) The evidence on the question is, at this stage, mixed, although there is some provocative evidence that calls into question the shareholder criterion.

We did a series of regressions on pooled cross-sectional data, using an ordinary least squares model, a model with firm dummies, and a fixed effects model. The variables were expressed in terms of percent changes, to normalize across firm size and over time. In regressing gT (the growth rate of total firm value) on S (annual return), the coefficient on S is approximately .40 in all models. (Regression 1) In similar regressions, the coefficients on gL (labor value) were lower, approximately .13. (Regression 2) The coefficients were statistically significant. This suggests that increasing shareholder value is associated with increasing total firm value.

In many respects this rough correlation is unsatisfactory. In particular, it seems to give little weight to the fact that strategies are adopted by firms, and that these strategies manifest themselves over time. In particular, measures that might increase the stock price immediately (because of the expectation of improved future cash flows) may have impact on labor value only in subsequent years, when contracts are reopened or hiring policies changed. Observable labor value changes slowly because jobs are not market-traded.

Thus we ran a series of logit regressions that addresses the questions: how likely is it that a high ranking by a firm on S would lead to a high ranking on gT? How likely is it that a high ranking on gL by a firm would lead to a high ranking on gt? It turns out out the coefficient on S and gL are almost the same, .36 and .34, (Regression 3) and that the coefficients don't change much when firm dummies are used (Regression 4).

We next looked at lagged variables, examining the relationship between S in one period in gT in subsequent periods. The comparisons among Regression 5 and Regressions 6 and 7 show that there is no strong relationship between S and gW over a one year period, there is a strong two year effect of S (in year one) on gW (over years one and two, whether by geometric average (.ll) or cumulative change (.30). Regressions 8 and 9 show that this effect decays by year three, suggesting that changes in policy that are quickly reflected in stock prices are more slowly assimilated into labor value. The fact that the association between increases and stock price and labor value is positive is very interesting, because it is supports the "growth," rather than redistributive, hypothesis developed descriptively above.

Putting together these two ideas, of firms as selecting strategies, and then strategies as manifesting their effects over time, we ran an ordered logit regression of cumulative returns over the entire period (Regression 10). This limited us to seven observations. It was interesting that the highest shareholder return (returnc_tot) was less powerfully linked to highest total firm value increase (rc_tot) (.45 but not really statistically significant [p=.227]) (Regression 10(a)) than highest labor value increase (rc_wage) (1.09, p=.057) (Regression 10(f).

Regression 1(a)

```
. regress g_total return

  Source |       SS       df       MS                  Number of obs =     112


------------------------------------------------------------------------------
 g_total |      Coef.   Std. Err.       t     P>|t|       [95% Conf. Interval]
---------+--------------------------------------------------------------------
  return |    .397839    .0822318      4.838   0.000       .2348748    .5608032
   _cons |   .1133526    .0384481      2.948   0.004       .0371574    .1895478
------------------------------------------------------------------------------
```

Regression 1(b)

```
  drop ztwa

. regress g_total z* return,


------------------------------------------------------------------------------
 g_total |      Coef.   Std. Err.       t     P>|t|       [95% Conf. Interval]
---------+--------------------------------------------------------------------
    zamr |   .0586037     .142295      0.412   0.681      -.2235726      .34078
    zdel |   .0873522    .1420016      0.615   0.540      -.1942422    .3689466
  zsouth |   .2448344    .1419962      1.724   0.088      -.0367493    .5264181
    ztex |   .2340777    .1418828      1.650   0.102      -.0472812    .5154365
   zunit |   .0383922    .1421785      0.270   0.788       -.243553    .3203375
     zus |   .1612866    .1420675      1.135   0.259      -.1204385    .4430118
  return |   .4027272    .0828632      4.860   0.000       .2384064     .567048
   _cons |  -.0048427    .1003341     -0.048   0.962      -.2038091    .1941236
------------------------------------------------------------------------------
```

Regression 1(c)

```
.  xtreg  g_total return, fe

Fixed-effects (within) regression               Number of obs      =       112
Group variable (i) : code                       Number of groups   =         7

R-sq:  within  = 0.1851                         Obs per group: min =        16
       between = 0.0002                                        avg =      16.0
       overall = 0.1755                                        max =        16

                                                F(1,104)           =     23.62
corr(u_i, Xb)  = -0.0251                        Prob > F           =    0.0000

------------------------------------------------------------------------------
 g_total |      Coef.   Std. Err.       t     P>|t|       [95% Conf. Interval]
---------+--------------------------------------------------------------------
  return |   .4027272   .0828632      4.860   0.000       .2384064     .567048
   _cons |   .1129497   .0385293      2.932   0.004       .0365447    .1893546
------------------------------------------------------------------------------
 sigma_u |   .0967497
 sigma_e |  .40129849
     rho |  .05493223   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(6,104) =     0.93             Prob > F = 0.4772
```

Regression 2(a)

```
. regress g_total   g_wage
```

g_total	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
g_wage	.1415379	.080439	1.760	0.081	-.0178734	.3009492
_cons	.1298404	.0421353	3.082	0.003	.0463381	.2133427

Regression 2(b)

```
. regress g_total  z*  g_wage
```

g_total	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
zamr	.0994111	.1561081	0.637	0.526	-.210157	.4089793
zdel	.1048544	.1560687	0.672	0.503	-.2046356	.4143444
zsouth	.2444618	.1572884	1.554	0.123	-.067447	.5563706
ztex	.1825653	.1599024	1.142	0.256	-.1345271	.4996578
zunit	.0739962	.1560001	0.474	0.636	-.2353579	.3833503
zus	.1764322	.1565935	1.127	0.262	-.1340985	.486963
g_wage	.1120547	.0842599	1.330	0.186	-.0550359	.2791453
_cons	.007276	.110277	0.066	0.948	-.2114074	.2259594

Regression 3

```
. ologit r_total   r_ret , tab
```

r_total	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
r_ret	.3651236	.0923468	3.954	0.000	.1841272	.54612

r_ret	r_total 1	2	3	4	5	6	7
1	.3001133	.2294361	.1630208	.118461	.0845112	.0602802	.0441774
2	.2293682	.209246	.1713208	.1387481	.1074485	.0814378	.0624306
3	.1712199	.1804032	.1688442	.1535644	.1310559	.1073774	.0875349
4	.1254141	.1480663	.156187	.1597007	.1520357	.1371695	.1214267
5	.090524	.1166312	.1362103	.155692	.1664987	.1683911	.1660527
6	.0646232	.0888933	.1127877	.1425043	.1712542	.1970192	.2229181
7	.0457602	.0660476	.0894295	.1230765	.1651645	.218093	.2924287

Regression 4

```
. ologit r_total z*  r_ret , tab
```

r_total	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
zamr	-1.06823	.602398	-1.773	0.076	-2.248908	.1124486
zdel	-.9139148	.6463561	-1.414	0.157	-2.180749	.3529199
zsouth	-1.493546	.6734415	-2.218	0.027	-2.813467	-.1736254
ztex	-1.014067	.6771059	-1.498	0.134	-2.341171	.3130357
zunit	-.6081879	.6136938	-0.991	0.322	-1.811006	.5946297
zus	-.996381	.6037561	-1.650	0.099	-2.179721	.1869591
r_ret	.363651	.0949977	3.828	0.000	.177459	.549843

		r_total						
firm	r_ret	1	2	3	4	5	6	7
american	1	.3293274	.2443236	.161269	.1097786	.0717505	.0485704	.0349804
american	2	.2544762	.228808	.1750948	.1324552	.0932204	.0663838	.0495615
american	3	.191773	.2022246	.1785928	.151793	.116892	.0889435	.0697811
american	4	.1415857	.169684	.1709321	.1640627	.1402594	.116072	.0974041
american	5	.102861	.1361988	.1539032	.1665062	.1597207	.1464279	.1343822
american	6	.0738169	.105425	.1310992	.1585385	.1714502	.177111	.1825592
american	7	.052494	.0793052	.1064728	.1420235	.1727898	.2037585	.2431562
delta	2	.2263224	.2186012	.1779501	.1412903	.1031118	.0753671	.057357
delta	3	.1689839	.1888325	.176657	.1580611	.127035	.099943	.0804875
delta	4	.1238467	.1553389	.1646677	.1663922	.1492258	.1286896	.1118392
delta	7	.0453277	.0697942	.0962807	.1332544	.1700461	.2126308	.272666
southwest	1	.429005	.2440598	.1361701	.0834945	.0510372	.0330911	.0231424
southwest	2	.343088	.245572	.158098	.1058593	.068434	.0459913	.0329575
southwest	3	.2663513	.232343	.1734158	.1287417	.0893755	.0630365	.0467362
southwest	4	.2015129	.2073003	.1787966	.1489134	.1128142	.0847796	.0658829
southwest	5	.1492474	.1753936	.1729697	.1626206	.1364636	.1111895	.0921157
southwest	6	.1086925	.1417647	.1573088	.1668413	.1568665	.1411569	.1273694
southwest	7	.0781453	.1103486	.1351974	.1605697	.1701447	.1720582	.1735362
texas	1	.317477	.2428774	.1638807	.1132249	.0747472	.0509372	.0368556
texas	2	.2443379	.2254363	.1763204	.1356392	.0966526	.0694376	.052176
texas	4	.1351297	.1646488	.168916	.1650922	.1435019	.1204405	.1022709
texas	5	.0979692	.1313775	.1507738	.1659598	.1620425	.1510689	.1408083
texas	6	.0701984	.1012134	.1274576	.156548	.1723459	.1814554	.1907813
texas	7	.0498644	.0758597	.1028573	.139035	.1720457	.2070761	.2532619
twa	1	.14437	.1717919	.1717155	.1635643	.1388726	.1142611	.0954246
twa	2	.1049769	.138241	.1551786	.1666654	.1586942	.1444831	.1317609
twa	3	.0753856	.1072236	.1326162	.1593168	.1710041	.1752612	.1791926
twa	4	.0536358	.0807855	.1079996	.1432443	.17303	.2023061	.2389988
twa	5	.0379038	.0595298	.0845294	.1218466	.164288	.2207045	.3111978
twa	6	.0266563	.0431466	.0641148	.0988279	.1468102	.2265266	.3939176
twa	7	.0186815	.0308959	.0474757	.077093	.1242212	.2184322	.4832005
united	1	.2366254	.2226453	.1771096	.1380625	.0993599	.0718929	.0543043
united	2	.1772747	.1939584	.1776197	.155876	.1232482	.0957195	.0763034
united	3	.1302701	.1607198	.1672044	.165737	.1459617	.1238935	.1062135
united	5	.0674916	.0980054	.1245993	.1548691	.172878	.1847706	.1973859
united	6	.0479013	.0732541	.1000653	.1366347	.1713	.2095137	.261331
united	7	.0337913	.053658	.0774499	.1143204	.1593677	.2241264	.3372863
usair	1	.313657	.2423357	.1646962	.1143493	.0757423	.051731	.0374885
usair	2	.2410872	.2242841	.1766689	.1366608	.0977833	.070458	.0530576
usair	3	.1808826	.1960971	.1779426	.1548877	.1216346	.0939639	.0745915
usair	4	.1330761	.1630031	.1682137	.1653792	.1445398	.1218819	.1039061
usair	5	.0964173	.1298184	.1497264	.1657308	.1627611	.1525845	.1429617
usair	6	.0690527	.0998617	.1262621	.155858	.1725866	.1828521	.1935267
usair	7	.0490331	.0747598	.1016848	.1380367	.1717509	.2081134	.2566213

Period One

Regression 5(a)

```
. regress g1_tot       return1
```

g1_tot	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
return1	.397839	.0822318	4.838	0.000	.2348748	.5608032
_cons	.1133526	.0384481	2.948	0.004	.0371574	.1895478

Regression 5(b)

```
. regress g1_tot    z*  return1
```

Source	SS	df	MS
Model	4.65290785	7	.664701121
Residual	16.7482094	104	.161040475
Total	21.4011173	111	.192802858

Number of obs	=	112
F(7, 104)	=	4.13
Prob > F	=	0.0005
R-squared	=	0.2174
Adj R-squared	=	0.1647
Root MSE	=	.4013

g1_tot	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
zamr	.0586037	.142295	0.412	0.681	-.2235726	.34078
zdel	.0873522	.1420016	0.615	0.540	-.1942422	.3689466
zsouth	.2448344	.1419962	1.724	0.088	-.0367493	.5264181
ztex	.2340777	.1418828	1.650	0.102	-.0472812	.5154365
zunit	.0383922	.1421785	0.270	0.788	-.243553	.3203375
zus	.1612866	.1420675	1.135	0.259	-.1204385	.4430118
return1	.4027272	.0828632	4.860	0.000	.2384064	.567048
_cons	-.0048427	.1003341	-0.048	0.962	-.2038091	.1941236

Regression 5(c)

```
.
. regress g1_wage      return1
```

g1_wage	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
return1	-.055392	.1057305	-0.524	0.601	-.264925	.1541409
_cons	.1197418	.0494351	2.422	0.017	.021773	.2177107

Regression 5(d)

```
.
. regress g1_debt      return1
```

g1_debt	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
return1	.2152795	.1252001	1.719	0.088	-.0328377	.4633966
_cons	.1874192	.0585383	3.202	0.002	.0714101	.3034283

Period One + Period Two: Yearly (Geometric) Average of Growth in T, W, D vs. Period One Shareholder Return

Regression 6(a)

```
.
. regress g2_tot        return2
```

g2_tot	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
return2	.2070432	.0530531	3.903	0.000	.1018249	.3122614
_cons	.1101033	.0251001	4.387	0.000	.0603233	.1598834

Regression 6(b)

```
.
. regress g2_wage       return2
```

g2_wage	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
return2	.1174168	.0415355	2.827	0.006	.035041	.1997927
_cons	.0768703	.019651	3.912	0.000	.0378972	.1158433

Regression 6(c)

```
regress g2_debt          return 2
```

g2_debt	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
return2	.1581261	.0704155	2.246	0.027	.0184736	.2977785
_cons	.15442	.0333144	4.635	0.000	.0883487	.2204913

Period One + Period Two: Cumulative Growth in T, W, D vs. Period One Shareholder Return

Regression 7(a)

```
.
.
. regress gc2_tot        return2

------------------------------------------------------------------------------
 gc2_tot |      Coef.   Std. Err.       t     P>|t|       [95% Conf. Interval]
---------+--------------------------------------------------------------------
 return2 |   .5482639   .1501181      3.652   0.000         .25054    .8459878
   _cons |   .2943747   .0710227      4.145   0.000       .1535179    .4352316
------------------------------------------------------------------------------
```

Regression 7(b)

```
.
. regress gc2_wage       return2

------------------------------------------------------------------------------
gc2_wage |      Coef.   Std. Err.       t     P>|t|       [95% Conf. Interval]
---------+--------------------------------------------------------------------
 return2 |   .3080661   .1061552      2.902   0.005       .0975323    .5185999
   _cons |    .194792   .0502234      3.879   0.000       .0951858    .2943981
------------------------------------------------------------------------------
```

Regression 7(c)

```
.
. regress gc2_debt       return2

------------------------------------------------------------------------------
gc2_debt |      Coef.   Std. Err.       t     P>|t|       [95% Conf. Interval]
---------+--------------------------------------------------------------------
 return2 |   .4656923   .2111317      2.206   0.030       .0469624    .8844223
   _cons |   .4364815    .099889      4.370   0.000       .2383751    .6345878
------------------------------------------------------------------------------

.
```

Periods One+Two+Three: Yearly (Geometric) Average of Growth in T, W, D vs. Period One Shareholder Return

Regression 8(a)

```
.
. regress g3_tot       return3
```

g3_tot	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
return3	.152996	.0424542	3.604	0.000	.0687251	.2372669
_cons	.1172087	.0207448	5.650	0.000	.0760306	.1583868

Regression 8(b)

```
.
. regress g3_wage      return3
```

g3_wage	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
return3	.048505	.0337973	1.435	0.154	-.0185822	.1155922
_cons	.0872166	.0165147	5.281	0.000	.0544352	.1199981

Regression 8(c)

```
.
. regress g3_debt      return3
```

g3_debt	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
return3	.0777085	.053899	1.442	0.153	-.0292801	.1846971
_cons	.1630403	.0263372	6.191	0.000	.1107615	.2153191

```
.
.
```

Periods One, Two, and Three: Cumulative Growth in T, W, D vs. Period One Shareholder Return

Regression 9(a)

```
.
.
. regress gc3_tot       return3
```

gc3_tot	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
return3	.7203198	.2260367	3.187	0.002	.2716404	1.168999
_cons	.5427558	.1104504	4.914	0.000	.3235135	.7619981

Regression 9(b)

```
.
.
. regress gc3_wage      return3
```

gc3_wage	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
return3	.1943758	.1505063	1.291	0.200	-.1043768	.4931285
_cons	.3707099	.0735433	5.041	0.000	.2247277	.5166922

Regression 9(c)

```
.
. regress gc3_debt      return3
```

gc3_debt	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
return3	.3612181	.2976897	1.213	0.228	-.2296912	.9521275
_cons	.8095336	.1454629	5.565	0.000	.5207922	1.098275

Regression 10(a)

```
. ologit   rc_tot   returnc, tab
```

rc_tot	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
returnc	.4535746	.3751783	1.209	0.227	-.2817614	1.188911
_cut1	-.295091	1.628051	(Ancillary parameters)			
_cut2	.5020276	1.440321				
_cut3	1.122886	1.404249				
_cut4	1.787363	1.482889				
_cut5	2.636206	1.745294				
_cut6	3.854395	2.198052				

Regression 10(b)

```
. ologit   rc_wage   returnc, tab
```

rc_wage	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
returnc	-.0372075	.3620505	-0.103	0.918	-.7468134	.6723985
_cut1	-1.942929	1.829615	(Ancillary parameters)			
_cut2	-1.060236	1.635414				
_cut3	-.417467	1.476168				
_cut4	.1666094	1.401843				
_cut5	.7961362	1.433913				
_cut6	1.66438	1.636511				

Regression 10(c)

```
. ologit   rc_debt   returnc, tab
```

rc_debt	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
returnc	.2973555	.3440814	0.864	0.387	-.3770316	.9717426
_cut1	-.7787392	1.599862	(Ancillary parameters)			
_cut2	.0703426	1.430519				
_cut3	.6779656	1.378426				
_cut4	1.273971	1.409405				
_cut5	2.059906	1.648799				
_cut6	3.119717	1.993343				

Regression 10(d)

```
. ologit   rc_tot   rc_wage, tab
```

rc_tot	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
rc_wage	1.09091	.5729732	1.904	0.057	-.0320967	2.213917
_cut1	1.603462	1.992841		(Ancillary parameters)		
_cut2	3.331226	2.405193				
_cut3	4.518686	2.771103				
_cut4	5.480727	3.0592				
_cut5	6.25497	3.220079				
_cut6	7.433814	3.550701				

Regression 10(e)

```
. ologit   rc_debt   rc_wage, tab
```

rc_debt	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
rc_wage	.1927826	.3357172	0.574	0.566	-.465211	.8507761
_cut1	-1.054387	1.668811		(Ancillary parameters)		
_cut2	-.1829518	1.519135				
_cut3	.4764732	1.53448				
_cut4	1.13469	1.682322				
_cut5	1.833223	1.843202				
_cut6	2.714089	1.987832				

Regression 10(f)

```
. ologit   rc_tot   rc_debt, tab
```

rc_tot	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
rc_debt	.9667232	.4655104	2.077	0.038	.0543396	1.879107
_cut1	.8044525	1.628597		(Ancillary parameters)		
_cut2	2.00453	1.649112				
_cut3	3.031202	1.809975				
_cut4	4.122103	2.12789				
_cut5	5.649401	2.722848				
_cut6	7.02628	3.023329				