

## VALUATION

### Overview

At this point we want to draw together the various discussions that we have had up to this point in the semester. No doubt, much of the discussion seems disjoint, even inscrutable. However, after we draw it together in the context of valuation, the pieces, while still obscure in certain ways, should be more meaningful.

Project valuation is one of the most practical tools of the financial analyst. It is virtually a trade, like real estate appraisal. Project valuation typically involves estimating what the stock price of a business venture would be if it were priced by the market. Sometimes this is important as a way of determining managerial compensation; sometimes it is important in assessing the IPO price of a spill off; sometimes it is important in deciding whether to undertake a new venture; and sometimes it is important in adjudicating a tort claim. It is the last that we will use as an example.

The case we will explore involved the bust-up of the Singer Company. Singer started as a sewing machine company. However, over the years it became a highly diversified manufacturing firm. The company made rifles during WWII, it had numerous small machine plants here in SC that made drills and vacuum cleaners. And, of course, it continued to make sewing machines.

In 1988, Singer was taken over by a corporate raider, Paul Bilzerian.<sup>1</sup> Bilzerian sold the Singer name to James Ting, a Hong Kong businessman. Ting sold Singer Furniture Company back to Bilzerian. A dispute arose over payments that Bilzerian was supposed to make to Ting. Ting sued to regain control of the company. A question arose as to its value.

### The Risk and Cash Flow

What we have discovered over that last month and a half is that the stock price of a company is based on the Discounted Cash Flow that the firm is expected to enjoy over the foreseeable future. The familiar formula is:

$$P = \sum_{t=0}^{\infty} \frac{CashFlow_t}{(1+r)^t}$$

There are two elements of the DCF equation. One, the cash flows must be forecast. Call these  $\hat{C}_t$ . Two, the appropriate discount rate must be chosen. Call this  $\hat{r}$ .

Market participants are constantly working to evaluate the price of each stock to determine whether it correctly reflects its fundamental DCF value. Insiders and information gatherers acquire knowledge about the cash flows that a company can anticipate. These people study markets and products, managerial decisions, and corporate policies. From this study, they make informed opinions about the future cash flows of a company.

Uninformed investors are investors with no special knowledge about the future cash flows of a company. They know what is publicly available and do not spend resources to discover new information. They are risk averse. They form portfolios of assets in order to achieve the highest possible utility by trading off return for lower risk. Portfolio diversification

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<sup>1</sup> Bilzerian gained notoriety by going to jail for illegal stock trading. The SEC tried to pry the gains he made in the Singer deal and others away from him. He declared bankruptcy in Florida and kept his multimillion dollar home. It is claimed that he stashed a good bit out of the country.

has the effect of lowering risk holding return constant. In the process of choosing among assets to hold in their portfolios, uninformed investors minimize variance by holding many, many different assets. In the limit, they hold all assets. The amount of each asset that they hold is based on the correlation of the return of that asset to all other assets. In choosing among assets, investors force the returns of each asset to obey the Capital Asset Pricing Model. That is, the CAPM identifies the expected return to each asset:

$$[E(r_i) - r_f] = \beta_i \cdot [E(r_m) - r_f]$$

This expected return is the rate of return at which the firm's cash flows are discounted. The expected market return minus the risk free is called the Equity Risk Premium (ERP) of which we spoke in an earlier lecture. Thus, we can write the formula that identifies the discount formula as:

$$E(r_i) = \hat{r} = r_f + \beta_i \cdot ERP$$

This gives us three variables that we must assign values to in order to determine the proper discount rate. They are: the risk free return, the equity risk premium, and the beta for the project that we are evaluating.

### **CAPM and Valuation**

A careful student might ask at this point, "Is the price of an asset fully identified in terms of its expected future cash flows discounted at the appropriate risk adjusted rate?" The CAPM says, "Yes!"

The Capital Asset Pricing Model says that stocks are priced according to their expected cash flows and the covariance of these cash flows with the expected cash flows of other assets. Hence there are only two pieces of the puzzle as shown in (1)—*Cash Flows* and  $r$ . The appropriate  $r$  comes from (2) based on the estimation of  $\beta$  given in (3). No doubt, the CAPM is imperfect empirically. However, it is complete and logically consistent.

Stock prices change everyday. The stock market moves almost everyday. The stock market is the aggregation of all of the securities that are traded. We sometimes think of the stock market at the Dow Jones Industrial Index, which just 30 large stocks. The market is often identified as all NYSE stocks. At the end of 1996, there were 2777 stocks traded on the NYSE. Sometimes we reference the market by the S&P 500, which is an index of the 500 largest stocks, mostly NYSE. There were 8763 stocks reported by CRSP trading on the NYSE, AMEX, and NASDAQ at the end of 1996.

The stock market is an index of all of these securities. Movement in the market is the aggregated change in the price of each of these securities. Each security changes because of revisions in the expectation concerning its cash flows and/or the correlation of its cash flows with the cash flows of all other securities. In a simple characterization of the market, there are informed traders who buy and sell assets based on new information about expected cash flows. On the other hand, there are uninformed traders who buy and sell to rebalance their portfolios. If all investors held all assets in a value-weighted portfolio, there would be no need to rebalance. However, investors hold imperfectly diversified portfolios that are comprised of only a subset of

securities. As a consequence when new information about cash flows changes the value and the variance of the assets in a suboptimal portfolio, investors must rebalance.<sup>2</sup>

The Efficient Market Hypothesis says that the instant that information is known, it is impounded in the price of securities. It is the case that stock prices vary more than the underlying cash flows, when we observe them in hindsight. This is sometimes referred to as "excess volatility." The cause of this will become the focus of future inquiry.

### The Risk Free and Risk Premium

We talked at some length about two of three ingredients in the formula for the discount rate, the risk free return and the ERP. However, it is useful to renew this discussion in particular reference to valuation.

Cash flows come over time, and therefore they must be adjusted to reflect their current or present value. The crucial issue is that the discount rate should match the riskiness of the cash flows expected to accrue to the project. If the future cash flows were known with certainty, the proper discount rate for a firm with a long life would be the U.S. Treasury long bond rate (that is, an almost risk free investment). Since the nominal cash flows resulting from purchasing a U.S. Treasury bond are expected to occur with a probability close to 1, this rate measures the risk free portion of the discount rate. This is the time value of money component of the overall discount rate. Furthermore, we can take inflation out the calculation by using the TIPS yield. Thus, we have an almost perfect representation of a truly riskless investment. This would be correct rate to use if the cash flows from the venture under consideration were to accrue with certainty.

However, for firms, cash flows are not expected to occur with absolute certainty. Consequently, a risk premium must be added to the risk free rate in order to account for the imbedded uncertainty. This risk premium will vary from firm to firm and across industries. Computer software companies have high discount rates whereas public utilities (traditionally) have low rates. Variation across firms reflect variation in risk.

The overall level of risk is measured by the amount that more risky securities outperform less risky ones. The most extreme dichotomy that draw is between all risky securities and U.S. Treasury bonds. While U.S. bonds have not been a perfect measure of the riskless asset, they come the closest. This difference, then, is our best measure of the ERP.

As we discussed earlier, there is some reasonable question about what the true level of the ERP is. The historical difference between the market return and government bond return is around 8 percent. This is arguably too high for several reasons. If we take the historical return on risky securities and subtract the TIPS yield, which would account for full protection against both default and inflation, then we get an ERP of around 6 percent. However, to fully rationalize the current level of the market, an ERP of 3 is required. While we can't be absolutely sure about the correct ERP, the range seems reasonably set at 3 to 6 percent.

### The Estimation of Beta

The theory says that stocks are priced linearly on the basis of the beta applicable to each security. Beta is a linear multiplier. Beta comes from the CAPM *market model*

$$r_{it} = \alpha_i + \beta_i r_{mt} + \varepsilon_{it}$$

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<sup>2</sup> Of course, if new information alters the correlation of assets with the market, rebalancing is also required.

In the market model, the parameters  $\alpha$  and  $\beta$  are the discount rate component of the stock price and  $\epsilon$  is the information component. If the company has good management or a unique computer system or a crook for a bookkeeper, all this goes in epsilon. For instance, at the instant that the market recognizes that a firm's management is better than it was heretofore supposed, the stock price jumps and for that instant,  $\epsilon$  is positive. To the extent that the company is in textiles which vary with auto sales, this affects the rate at which the firm's cash flows should be discounted and this is captured in  $\beta$ .

The theory says is that high betas have greater risk than low betas. In this context, one would expect computer software firms to have higher betas than utilities. This is true and is an explanation of why investors demand higher returns for holding computer software stocks than utilities. To provide a brief example, consider AMR, the parent of American Airlines. AMR has a beta of about 1.3. This beta is based on the historical relation between movements in AMR stock and movements in the overall market. Since the beta exceeds one, it suggests that holding AMR stock is riskier than holding a portfolio of stocks that resemble the S&P 500. The interpretation of beta is that when the market increases 10 percent, AMR stock is expected to increase on the order of 13 percent. However, when the market declines by 10 percent, the price of AMR is expected to fall by 13 percent.

When we forecast the expected return for a particular stock like AMR that is publicly traded we can use the information contained in the trades to asset beta. We estimate the market model as in (2) to give us beta. Publicly traded firms are being evaluated all the time in terms of their price relative to the two components of the DCF formula. The current price of an asset can be wrong because its expected cash flows are in error or because the discount rate at which these cash flows are weighted is in error.

The market model is directly estimated using Ordinary Least Squares linear regression.<sup>3</sup> That is, OLS estimators from

$$r_i = \hat{\alpha}_i + \hat{\beta}_i \cdot r_m$$

give us beta. All we need are data for returns on the  $i^{\text{th}}$  asset and returns on the market. We run the regression and get beta. This estimate of beta is historical. Hence, it is an estimate of the true beta that theory says is used to set the price of common stock for the  $i^{\text{th}}$  firm. When estimating beta, we need to be cognizant of this. We should use as much data as is available subject to the rule that as the business interest of the firm changes, its beta will change.

The proper market index to use in estimating beta is open to question. The true market portfolio is unavailable. The theory says that investors hold a portfolio of *all* risky assets. Because this is too costly, inefficient subsets are created. (This was the content of the discussion of lecture 6.) For practical purposes, there are three main candidates for  $r_m$ : the CRSP market index of all securities covered by CRSP (NYSE, Amex, Nasdaq); the S&P 500; or the Dow Jones Industrials. The DJ is the worst. It is only 30 stocks. S&P 500 is ok. It is the 500 major stocks in the economy value weighted. The CRSP index comes both equally and value weighted. Theory speaks to the value weighted. However, in practice, it is most common to see the equally weighted index used. I suspect this has to do with the problem of inefficient portfolios. It would be interesting to see if a composite index could be created from mutual funds that cover risky ventures outside of those measured by U.S. traded common stocks.

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<sup>3</sup> There is no theoretical concern about autocorrelation because efficient markets says that autocorrelation would imply a trading rule that would be arbitrated away.

### *Comparable Firms*

When we are valuing assets that are not publicly traded, we must use other means to estimate the value of beta that will be used in the CAPM formula to determine the proper discount rate. The best way to do this is to identify a set of comparable firms. This is true because the stock market has already assigned an unbiased value to the future cash flows expected to accrue to these firms. In its pricing of these assets, the market has embodied its evaluation of the riskiness of the cash flows in these types of enterprises.

The selection of the comparable or “twin” firms is based on the asset, firm or project under consideration. For example, assuming that Time Inc. applied valuation models in its 1989 acquisition of Warner Communications, the comparable firms would be entertainment firms similar to Warner rather than publishing entities similar to Time Inc.

For our case study, we must come up with comparable firms for Singer Furniture Company (SFC). The appropriate approach in identifying comparable firms to SFC is to use a portfolio of publicly-traded firms that focus primarily on manufacturing furniture. These comparable firms could be considered twins of Singer Furniture Company. *Value Line* classifies firms by industry so the firms that it identifies are publicly traded furniture manufacturing enterprises that satisfy this criterion.

*Value Line Investment Surveys* tracks widely-followed firms that are listed on the major stock exchanges. In all, Value Line covers around 1,700 firms in nearly 100 Value Line designated industries. Value Line's *furniture/home furnishings* industry contains 9 firms which engage in various types of furniture manufacturing during the period 1991 and 1992. The list of the 9 firms in this Value Line industry category are shown at the end of this document with details their business activities.

To estimate the discount rate for Singer Furniture Company, the betas from the nine comparable firms are used. A simple calculation of the beta for a furniture company is to average the returns of these 9 firms over some period, say, 5 years and regress this equally weighted portfolio return on the market return. The comparable firms are discussed below:

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#### COMPARABLE FIRMS IN THE VALUATION OF SINGER FURNITURE CO.

BASSETT FURNITURE INDUSTRIES, INC. manufactures a wide range of bedroom, dining room, and living room furniture. Also makes various lines of occasional chairs, tables, wall units, upholstered furniture, mattresses and box springs. Plants are located primarily in Virginia, North Carolina, and Florida. Products are sold to dealers through commissioned sales representatives. Sales to J. C. Penney accounted for 13% of total 1992 sales. 1992 depreciation rate: 4.3%. Estimated plant age: 17 years. Has about 8,100 employees; 2,400 shareholders. Insiders own 2% of common.

FLEXSTEEL INDUSTRIES, INC. manufactures chairs, sofas, loveseats, sofa-sleepers, and recliners for home markets (64% of 1992 sales). Distribution through approximately 3,000 furniture retailers and department stores plus several national chains. Also makes seating products for the recreational vehicle field (28%), where it is a leading supplier to the van conversion business. Commercial seating division (8%) established in 1986. Operates 8 plants in 8 states. 1992 depreciation rate: 6.45%. Estimated plant age: 10 years. Average number of 1992 employees: 2,040; 1,600 shareholders. Insiders own 24% of the stock.

HON INDUSTRIES INC. is one of the largest manufacturers of metal and wood office furniture in the United States. Sells a complete product line, including file cabinets, desks, chairs, wall systems and credenzas. Major emphasis is on the mid-priced range. Also sells computer-related products and manufactures factory-built fireplaces for homes. Sold Prime-Mover, 12/88. Bought Gunlocke, 10/89. 1991 depreciation rate: 6.4%. Has about 5,600 employees, 4,466 shareholders.

KIMBALL INTERNATIONAL, INC. manufactures and markets office furniture and seating under the Kimball, National, and Harpers brands; office furniture systems (Cetra); hospitality, healthcare and reproduction furniture (Kimball); and pianos (Bosendorfer and Kimball). Kimball also manufactures for other end-users electronic assemblies, TV and audio cabinets, home furniture, molded plastics carbide, cutting tools and metal stampings. 1992 depreciation rate: 8.0%. Estimated plant age: 6.9 years. Has about 7,600 employees; 635 Class A shareholders, 2,525 Class B shareholders. Insiders own about 32% of Class A, 21% of Class B.

LADD FURNITURE INC. is a leading manufacturer of wood, metal, and upholstered furniture for bedrooms, dining rooms, living rooms, and kitchens, mainly in the low-medium to high-medium price range. Also makes plywood furniture components and runs a trucking fleet. Acquired American Furniture 10/86; Pennsylvania House and Jordan Brown 7/89. Has 22 manufacturing plants and 4 warehouse facilities in seven states and Mexico. 1991 depreciation rate: 10.9%. Has about 6,340 employees, 970 share holders. Insiders own 38% of common; Brinson Partners, Inc. 5.1%

LA-Z-BOY CHAIR CO. is the largest manufacturer of reclining chairs in the United States. Other residential products include occasional tables, wall units, dining room and bedroom furniture. Also sells furniture to offices and healthcare businesses. Acquired La-Z-Boy Canada Ltd., in '79; Burriss Industries, '85; RoseJohnson, '85; Hammary, '86; Kincaid, '87. 1991 depreciation rate: 8.0%. Estimated plant age: 6 years. Has about 8,150 employees; 8,080 shareholders. Directors and officers own 13% of stock; Monroe Bank & Trust (as trustee of a number of revocable and irrevocable trusts), 24%.

LEGGETT & PLATT, INC. manufactures spring assemblies for mattresses, boxsprings, and upholstered furniture; mechanical assemblies for action chairs and convertible sofas; polyurethane foam; bases for furniture; and diversified specialty products. The company also makes and sells sleep-related finished furniture and carpet cushioning materials. 1991 sales breakdown; bedding components: 31% of total, furniture components: 24%, finished products: 22%. Has about 10,400 employees; 5,540 shareholders of record. 1991 depreciation rate: 8.7%. Estimated plant age: 5 years.

HERMAN MILLER, INC. is a leading producer of "open space" free-standing modular office partitions and furniture for offices, institutions, health care facilities, and laboratories. Has 14 plants in the United States, 2 in United Kingdom. Also licenses manufacturing rights in Japan. About 90% of sales are through independent dealers. Foreign sales: 17% of total. R&D: 2.5%. 1992 depreciation rate: 7.4%. Estimated plant age: 6 years. Has about 5,490 employees, 13,000 shareholders. Officers and directors own 3.6% of stock; Ariel Capital Management, 7.8%; Trimark Investment, 9.8%; Reich & Tang, 7.3%.

SHELBY WILLIAMS INDUSTRIES, INC. designs, manufactures, and distributes furniture, primarily to the hotel and food service industries. Also designs and manufactures furniture for health care, university, and office facilities; and produces wall coverings and distributes textiles for furniture. Acquired preview Furniture Corp. 5/85; Sellers & Josephson, Inc. 6/86; chair operations of Thonet 2/87; Pacific Home furnishings 8/88. 1991 depreciation: 6.1% Estimated plant age: 6 years. Has about 1,602 employees, 3,200 shareholders.

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### **The Effect of Capital Structure on Beta**

Our inquiry thusfar has led us to the conclusion that the expected return to an asset is equal to the risk free return plus beta times the risk premium, where the risk premium is the expected return to the market minus the risk free return. This is the simple CAPM analysis, and while there is some empirical slippage, these, like black-holes in space, do not greatly affect our everyday lives. By this I mean that CAPM is still a very useful tool in understanding the way financial markets work and in practicing financial economics. In the practice of financial economics, there is one detail that we have yet to fully explore. That is the relationship between beta and capital structure.

The typical U.S. corporation has debt in addition to equity. While shareholders are the residual claimants and thus own the equity, they cannot claim all the value of the corporation as debt holders have a fixed claim. The total value of the firm is

$$V = D + E,$$

where  $V$  is total firm value,  $D$  is debt, and  $E$  is equity. As we learned in the last lecture, the debt to equity ratio across all corporations is somewhere around .5, but it has a lot of variation. The discount rate for a firm depends on the business risk of the firm's overall cash flows. The risk of common stock (as proxied by the estimated value of beta) reflects the business risk of the future cash flows and the assets held by the firm. In addition, to the extent that the firm issues debt to finance its investment opportunities, shareholders bear financial risk as well. The more that a firm relies on debt financing, the riskier its common stock. That is, borrowing creates financial leverage, and hence risk. In CAPM jargon, as a firm increases its debt/equity ratio, its beta goes up correspondingly.

The beta for the business risk inherent in a venture, company, corporation, etc., can be called the "asset" beta. The beta for the equity portion of a common stock corporation is simply the equity beta. The relationship between the asset beta and the equity beta is:

$$\beta_a = \beta_e \frac{E}{D + E} + \beta_d \frac{D}{D + E}$$

It is common though not entirely accurate to assume that the debt beta is zero. In this simplifying case, the equity beta is equal to the asset beta times one plus the debt-equity ratio.

$$\beta_e = \beta_a \left[ \frac{D}{E} + 1 \right]$$

The implication is that for a group of firms, for instance, firms whose business is almost entirely in electric utility service, the equity betas should vary based on the debt-equity ratio. That is, the higher the debt-equity ratio, the higher the observed equity beta. Similarly, we can calculate the underlying asset beta by weighting the observed equity and debt betas by their respective capital structure proportions.

### Calculation of the Asset Beta

To estimate the discount rate for Singer Furniture Company, the betas from the nine comparable firms were used. Two methods were used to obtain equity betas for the nine comparable firms. First, Value Line Investment Surveys reports betas for these companies. Second, betas for these nine stocks were calculated using monthly stock returns over the 1987-91 period. The Value Line betas come from the December 31, 1991 issue and are shown in the first column below. They range from .65 to 1.1. The calculated betas are displayed in the second column. They are quite similar to the Value Line betas with few exceptions. The two different estimates are averaged in the third column.

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**Table 1**  
**Betas in the Furniture Industry**

|                                    | Beta Reported<br>in Value Line | Beta Estimated<br>From Monthly<br>Stock Returns<br>Data | Average of the<br>Betas |
|------------------------------------|--------------------------------|---|-------------------------|
| BASSETT FURNITURE INDUSTRIES, INC. | 0.80                           | 0.72  | 0.76                    |
| FLEXSTEEL INDUSTRIES, INC.         | 0.65                           | 0.88  | 0.77                    |
| HERMAN MILLER, INC                 | 0.85                           | 1.33  | 1.09                    |
| HON INDUSTRIES INC.                | 0.75                           | 0.73  | 0.74                    |
| KIMBALL INTERNATIONAL, INC.        | 0.95                           | 0.83  | 0.89                    |
| LADD FURNITURE INC.                | 1.10                           | 1.30  | 1.20                    |
| LA-Z-BOY CHAIR CO.                 | 0.80                           | 0.95  | 0.88                    |
| LEGGETT & PLATT, INC.              | 0.85                           | 1.10  | 0.98                    |
| SHELBY WILLIAMS INDUSTRIES, INC.   | 1.00                           | 0.93  | 0.97                    |
| <b>INDUSTRY AVERAGE</b>            |                                |   | <b>0.92</b>             |

## Notes:

Betas estimated from monthly returns including dividends over the period December 31, 1986 through December 31, 1991 and using the S&P 500 return for the market return.

Value Line Betas taken from Value Line Investment Survey of the Furniture/Home Furnishings Industry, dated January 24, 1992.

The next table shows the calculation of the unlevered betas based on the equity betas and the capital structure of the comparable firms.

**Table 2**  
**Asset Betas and Capital Structure in the Furniture Industry**

|                                    | Average<br>Beta | Equity Value<br>(millions) | Value of<br>Debt<br>(millions) | Ratio of Equity<br>Value to Total<br>Value | Unlevered<br>Beta |
|------------------------------------|-----------------|----------------------------|--------------------------------|--|-------------------|
| BASSETT FURNITURE INDUSTRIES, INC. | 0.76            | \$274.752                  | \$0.000                        | 1.00                                       | 0.76              |
| FLEXSTEEL INDUSTRIES, INC.         | 0.77            | \$73.216                   | \$0.700                        | 0.99                                       | 0.76              |
| HERMAN MILLER, INC.                | 1.09            | \$478.688                  | \$54.700                       | 0.90                                       | 0.98              |
| HON INDUSTRIES INC.                | 0.74            | \$544.349                  | \$33.600                       | 0.94                                       | 0.70              |
| KIMBALL INTERNATIONAL, INC.        | 0.89            | \$431.460                  | \$4.400                        | 0.99                                       | 0.88              |
| LADD FURNITURE INC.                | 1.20            | \$176.514                  | \$125.300                      | 0.58                                       | 0.70              |
| LA-Z-BOY CHAIR CO.                 | 0.88            | \$364.614                  | \$55.900                       | 0.87                                       | 0.76              |
| LEGGETT & PLATT, INC.              | 0.98            | \$566.565                  | \$179.400                      | 0.76                                       | 0.74              |
| SHELBY WILLIAMS INDUSTRIES, INC.   | 0.97            | \$66.959                   | \$11.000                       | 0.86                                       | 0.83              |
| <b>INDUSTRY AVERAGE</b>            |                 |                            |                                |  | <b>0.79</b>       |

## Notes:

Debt and equity data are taken from Value Line Investment Survey of the Furniture/Home Furnishings Industry, dated January 22, 1993.

## Other Applications of Asset Betas

### *Electric Utility Betas*

There are at least two other research topics where the notion of asset betas as opposed to equity betas have been analyzed. Both involve the electric utility industry.

Years ago, Sam Peltzman extended Geo. Stigler's theory of government regulation. The Peltzman model predicted that economic regulation was a way in which the government allowed for controlled monopolization in which firms extract some but not all of the monopoly rents available from their markets. He argued that the regulatory process was like a buffer between firms and consumers.

On the basis of this buffer theory, Peltzman predicted that regulated monopolies would have lower systematic risk, i.e., lower betas, because when times were good, they would be restrained by government, but when times were bad, government would let them gouge the consumers a little more to make up for the bad times.

One of Peltzman's students, Seth Norton, pointed out (JLE 10/85) that the Peltzman effect was a prediction about unlevered betas. Peltzman had tested his hypothesis using levered betas and found only weak results. When Norton went back and unlevered electric utility betas, the Peltzman effect showed up quite strongly. Norton was insightful in seeing the obvious. Everyone knows that utilities typically have more debt,<sup>4</sup> and that their debt, at least until the nuclear crisis, was always higher grade than average. This extra leveraging is a straightforward market response to the fact that the asset betas are lower, thus making the bankruptcy cost of debt lower.

### *Electric Utility Unbundling*

As competition is unfolding in the electric industry, the process is causing betas to increase. This is an interesting result to students of financial economics. Obviously, what is going on is the evaporation of the Peltzman effect. As companies face competition, the buffer that they used to enjoy is going away.

Note that it is not fair to claim that competition is making beta go up because it is increasing the risk that one company will beat out another in the industry scramble. Such risk is idiosyncratic and can be diversified away by holding a portfolio of all the firms in the electric utility industry.

The process of allowing competition in the electric industry has been labeled unbundling. Electric utilities are being forced to allow competitor to access the customers that are connected to their lines. This is the same thing that happens in telecommunication where multiple companies vie to supply long distance service to the same household by offering that household service over the lines of the local distribution company. In electricity, there will be multiple competitors offering electric generation over the lines of the local utility.

Unbundling in telecomm was achieved by making AT&T divest its local telephone service subsidiaries. Unbundling in electricity has not yet gone so far. However, the local electric utilities (where there is competition, which is regrettably not here in SC) are mandated to functionally separate their operations into generation, transmission, and distribution. T&D will remain regulated while generation is competition. The local utility is supposed to charge rates for its T&D that recover only the costs of providing those services. The price that is charged for generation is then competitively determined.

Of course, it is a very difficult task to split this baby. The utilities have a strong interest some political clout in setting T&D charges at levels that continue to return the same monopoly

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<sup>4</sup> D/E is around .8 compared to .5 for other industrial companies.

rents that they have always enjoyed. The practical way that they attempt to do this is by loading their own generation costs into the T&D charges that they are allowed to charge competing suppliers. One very subtle but nontrivial way that they do this is by petitioning the regulatory commission to allow them to continue to use the allowed rate of return that was formerly approved for GT&D for T&D only. In other words, the utility asks (and so far has been allowed) to receive a return on its investments in transmission and distribution based on the riskiness of generation, transmission, and distribution.

In a paper we published in the *Public Utilities Fortnightly*, we pointed out the fallacy of this approach using the basic CAPM analysis.<sup>5</sup> The business risk of electricity is a linear combination of the business risk of GT&D. If G is unbundled from T&D, the risk of only T&D should be used to calculate the allowed rate of return. We argue that G is more risky than T&D. Consequently, if the charges for T&D are based on a more risky return calculated by including G, the charges are too high. Utilities are being allowed a monopoly reward (no big surprise). Competition is not bring the full measure of savings and benefits to consumers.

This paper was followed by a letter to editor in which the writer made the classic sophomore mistake of arguing that risk goes down when the utility functions are integrated in one company, and therefore risk in T&D will go up when the functions are unbundled. As you can imagine, my letter in reply was sharply worded.

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<sup>5</sup> "The Wires Charge: Risk and Rates for the Regulated Distributor," with Robert E. McCormick and Cleve B. Tyler, *Public Utilities Fortnightly*, September 1, 1997, 26-33.