KENTUCKY-AMERICAN WATER COMPANY
CASE NO. 2007-00143
ATTORNEY GENERAL'S REQUEST FOR INFORMATION

Item 1 of 312

Witness: Dr. James H. Vander Weide

1. RE: Vander Weide Direct Testimony. With respect to page 2, lines 12-14, please provide a list of the articles and books authored by Dr. James H. Vander Weide.

<u>Response</u>:

A list of Dr. Vander Weide's articles and books is shown below.

"The Lock-Box Location Problem: a Practical Reformulation," *Journal of Bank Research*, Summer, 1974, pp. 92C96 (with S. Maier). Reprinted in *Management Science in Banking*, edited by K. J. Cohen and S. E. Gibson, Warren, Gorham and Lamont, 1978.

"A Finite Horizon Dynamic Programming Approach to the Telephone Cable Layout Problem," *Conference Record*, 1976 International Conference on Communications (with S. Maier and C. Lam).

"A Note on the Optimal Investment Policy of the Regulated Firm," *Atlantic Economic Journal*, Fall, 1976 (with D. Peterson).

"A Unified Location Model for Cash Disbursements and Lock-Box Collections," *Journal of Bank Research*, Summer, 1976 (with S. Maier). Reprinted in *Management Science in Banking*, edited by K. J. Cohen and S. E. Gibson, Warren Gorham and Lamont, 1978. Also reprinted in *Readings on the Management of Working Capital*, edited by K. V. Smith, West Publishing Company, 1979.

"Capital Budgeting in the Decentralized Firm,' *Management Science*, Vol 23, No. 4, December 1976, pp. 433-443 (with S. Maier).

"A Monte Carlo Investigation of Characteristics of Optimal Geometric Mean Portfolios," *Journal of Financial and Quantitative Analysis*, June, 1977, pp. 215-233 (with S. Maier and D. Peterson).

"A Strategy which Maximizes the Geometric Mean Return on Portfolio Investments," *Management Science*, June, 1977, Vol 23, No. 10, pp. 1117-1123 (with S. Maier and D. Peterson).

"A Decision Analysis Approach to the Computer Lease-Purchase Decision," *Computers and Operations Research*, Vol. 4, No. 3, September, 1977, pp. 167-172 (with S. Maier).

“A Practical Approach to Short-run Financial Planning,” *Financial Management*, Winter, 1978 (with S. Maier). Reprinted in *Readings on the Management of Working Capital*, edited by K. V. Smith, West Publishing Company, 1979.

“Effectiveness of Regulation in the Electric Utility Industry,' *Journal of Economics and Business*, May, 1979 (with F. Tapon).

“On the Decentralized Capital Budgeting Problem Under Uncertainty,” *Management Science*, September 1979 (with B. Obel).

“Expectations Data and the Predictive Value of Interim Reporting: A Comment,” *Journal of Accounting Research*, Spring 1980 (with L. D. Brown, J. S. Hughes, and M. S. Rozeff).

“Deregulation and Oligopolistic Price-Quality Rivalry,” *American Economic Review*, March 1981 (with J. Zalkind).

“Incentive Considerations in the Reporting of Leveraged Leases,” *Journal of Bank Research*, April 1982 (with J. S. Hughes).

“Forecasting Disbursement Float,” *Financial Management*, Spring 1981 (with S. Maier and D. Robinson).

“Recent Developments in Management Science in Banking,” *Management Science*, October 1981 (with K. Cohen and S. Maier).

“General Telephone's Experience with a Short-run Financial Planning Model,” *Cash Management Forum*, June 1980, Vol. 6, No. 1 (with J. Austin and S. Maier).

“An Empirical Bayes Estimate of Market Risk,” *Management Science*, July 1982 (with S. Maier and D. Peterson).

“The Bond Scheduling Problem of the Multi-subsidiary Holding Company,” *Management Science*, July 1982 (with K. Baker).

“A Decision-Support System for Managing a Short-term Financial Instrument Portfolio,” *Journal of Cash Management*, March 1982 (with S. Maier).

“Deregulation and Locational Rents in Banking: a Comment,” *Journal of Bank Research*, Summer 1983.

“What Lockbox and Disbursement Models Really Do,” *Journal of Finance*, May 1983 (with S. Maier).

“Financial Management in the Short Run,” *Handbook of Modern Finance*, edited by Dennis Logue, published by Warren, Gorham, & Lamont, Inc., New York, 1984.

“Measuring Investors' Growth Expectations: the Analysts versus Historical Growth Extrapolation,” *The Journal of Portfolio Management*, Spring 1988 (with W. Carleton).

"Entry Auctions and Strategic Behavior under Cross-Market Price Constraints," *International Journal of Industrial Organization*, 20 (2002) 611-629 (with J. Anton and N. Vettas).

Managing Corporate Liquidity: an Introduction to Working Capital Management, John Wiley and Sons, 1984 (with S. Maier).

For electronic version, refer to KAW_R_AGDR1#1_061807.pdf

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Item 2 of 312

Witness: Dr. James H. Vander Weide

2. RE: Vander Weide Direct Testimony. With respect to page 5, lines 9-10, please indicate how equity investors define and measure “comparable risk.”

Response:

Each equity investor has his own definition of comparable risk. Whatever the definition and measurement, however, an investor will demand the same expected return on investments of comparable risk. For the purposes of my testimony, I have defined investments of comparable risk as being investments in publicly-traded water companies and publicly-traded natural gas distribution companies.

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Item 3 of 312

Witness: Dr. James H. Vander Weide

3. RE: Vander Weide Direct Testimony. With respect to page 16, lines 1-17, and Appendix 1, please provide copies of all theoretical and empirical studies known to Dr. Vander Weide that compare and contrast the quarterly and annual DCF models.

<u>Response</u>:

My use of the quarterly DCF model is based on the theoretical discussion contained in Appendix 1 of my direct testimony. Although I did not rely on any other studies that compare quarterly and annual DCF models, I am aware of several articles that discuss the use of quarterly versus annual DCF models. Please see the attached articles.

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Estimation Biases in Discounted Cash Flow Analyses of Equity Capital Cost In Rate Regulation

Charles M. Linke and J. Kenton Zumwalt

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I. Introduction

The discounted cash flow (DCF) valuation models commonly found in public utility rate regulation testimony generate biased estimates of a utility's cost of equity capital. These biases typically range in magnitude from 50 to over 200 basis points. Such biases are not trivial. A 100 basis point bias could alter a utility's request for increased total revenues by ten to fifteen percent.[1] This paper examines three of the most common sources of estimation biases in DCF equity cost estimates.

Section II illustrates the DCF implementation problem that arises when quarterly dividend payments are forced, unadjusted, into an annual DCF framework.[2] A simple solution to eliminate this systematic underestimation of equity capital cost is proposed. Section III demonstrates that a regulatory body's rate-year/rate-base practices generally require that the market-determined DCF equity cost estimate be adjusted to a regulatory allowed rate of return in order to estimate a utility's required quantity of earnings and revenues. An adjustment procedure is developed that avoids misstating a utility's required earnings and revenues. Section IV considers the practice of some rate of return analysts of converting a DCF market determined annual rate of return to a continuously compounded rate of return. It is shown that the frequency of compounding is irrelevant if the lower continuously compounded rate of return is implemented employing a rate base

[1] A review of recent rate relief requests by a gas distribution utility, a telecommunication firm, and an electric utility in a large industrial state revealed that a 100 basis point bias in the equity cost estimate would account for approximately nine percent, fifteen percent, and eleven percent of the total revenue increases requested.

[2] The typical DCF treatment uses either the sum of four quarterly dividends or the sum of four quarterly dividends multiplied by $(1+g)$. For the standard textbook DCF treatment, see [1, Chapter 15; and 10, Chapter 8]. In either case, the cost of equity will be understated unless the time value of quarterly dividends is considered. Although DCF analyses presented in rate regulatory hearings fail to recognize this bias, in recent years several academic rate of return witnesses have recognized this source of estimation bias. For example, see [5, 6, 8, 9].

In passing, it is worth noting that institutional investors' stock rankings based upon DCF expected returns may be altered by this bias. Also, DCF estimates of equity capital cost may be a source of bias in empirical financial research. Examples of empirical research using annual growth estimates and/or annual dividend values include [3, 4, 7].

construct that is consistent with continuous compounding.

II. The Quarterly Dividend Problem

The DCF model envisions the value of an asset as being determined by the cash flows expected from the asset and investors' required return which is determined by the time value of money and the required risk premium. Thus, for common stock the value or price today is the present value of all future dividends expected, including any liquidating dividend or sale price. That is,

$$P_0 = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \frac{D_3}{(1+k)^3} + \ldots + \frac{D_\infty}{(1+k)^\infty} = \sum_{t=1}^{\infty} \frac{D_t}{(1+k)^t} \qquad (1)$$

where D_t is the dividend paid at the end of period t, k is the required rate of return of investors or the market cost of equity capital, and P_0 is the current price of the stock. If dividends are expected to grow at a constant rate g for the indefinite future and $g < k$, Equation (1) can be rewritten as,

$$P_0 = \frac{D_0(1+g)}{(1+k)} + \frac{D_0(1+g)^2}{(1+k)^2} + \frac{D_0(1+g)^3}{(1+k)^3} + \ldots + \frac{D_0(1+g)^\infty}{(1+k)^\infty}$$

This formula reduces to the familiar Gordon Model,

$$P_0 = \frac{D_1}{k-g} \text{ or } k = \frac{D_1}{P_0} + g \qquad (2)$$

These equations describe a generalized DCF model that may be used to analyze any periodic (annual, quarterly, monthly, etc.) cash flow.

Problems arise when using the annual version of the model unless recognition is given to the fact that the quarterly dividends have an opportunity cost. Most firms pay dividends quarterly, and the price of the stock reflects both the timing and amount of the dividends. The typical application of the annual DCF model ignores the time value of quarterly dividends.[3] Quarterly versions of Equations (1) and (2) resolve the time value of quarterly dividends problem, but create a new problem related to the size of the dividends.

Problems with the Annual Growth Model

DCF analyses of stock values should give recognition to the fact that firms commonly pay dividends quarterly and that firms change their quarterly dividend rate only periodically. It is shown below that failure to adjust the quarterly dividend for the time value of money will cause the annual DCF model's estimate of the cost of equity capital to be understated.

Consider, for example, a firm that paid a \$.9432[4] annual dividend per share (quarterly dividends of \$.2358 per share) during the fiscal year just ended. Dividends are expected to increase 6.0 percent per annum or to \$.25 per share each quarter in the next fiscal year. The share price is \$8.00. The time configuration of the expected dividends is presented in Exhibit 1. The implied annual dividends associated with the Equations (1) and (2) annual models are also shown. The typical cost of equity capital estimate using the annual mode of Equations (1) or (2) is 18.5 percent,

$$\$8.00 = \frac{4(\$.25)}{(1+.185)} + \frac{4[(\$.25)(1+.06)]}{(1+.185)^2} + \ldots + \frac{4[(\$.25)(1+.06)^\infty]}{(1+.185)^\infty}$$

or $$k = \frac{\$1.00}{\$8.00} + .06 = .185 = 18.5\%$$

This formulation is correct *only* if the entire annual dividend is paid at year end as shown in the second row of Exhibit 1. But the present value of four quarterly dividends is greater than the present value of one year-end dividend. Indeed, the cost of equity capital is 19.375 percent when the timing and amount of dividends embodied in the market price of the stock are considered. That is, 19.375 percent is the iterative solution[5] to

[3]The CAPM suffers the same bias. This is apparent when the CAPM is rewritten in terms of P_0, or $P_0 = (P_1 + D_1)/[1 + R_f + \beta(R_m - R_f)]$, where P_0 is the current price, P_1 and D_1 are the expected price and dividend at the end of the next period, and $[1 + R_f + \beta(R_m - R_f)]$ is the risk-adjusted required return. In contrast, the time value of periodic payments is not ignored by bond dealers in the calculation of the yield to maturity for U.S. Government and corporate bonds.

[4]Although firms typically pay a dividend per share amount that is rounded to the nearest cent, the paper will use fractional cents for mathematical and expository convenience.

[5]An iterative solution procedure for solving Equation (1a) is

$$\$8.00 = \left[\frac{\sum_{Q=1}^{4} \$.25(1+k)^{1-.25Q}}{(1+.06)}\right]\left[\frac{1 - \frac{(1+.06)^t}{(1+k)^t}}{\frac{1+k}{1+.06} - 1}\right]$$

using a large value for t (*i.e.*, $t \geq 100$).

This equation is one of several formulations for growing cash flow streams. For example, the equation reduces to Equation A.8 in the text by Copeland and Weston [2, p. 706]. Also, as shown on page 17, when $D_1 = \sum_{Q=1}^{4} \$.25[1 + .19375]^{1-.25Q}$ the equation reduces to equation A.9 in Copeland and Weston. A trial and error process can be used to calculate the true cost of equity.

Exhibit 1. Expected Dividends Versus the Dividends Implied by the Annual and Quarterly Growth Models (annual growth rate = 6%; quarterly growth rate = 1.46738%)

	t_0 Fiscal Year End	Fiscal Year t = 1 Dividend at End of Q_1	Q_2	Q_3	Q_4	Fiscal Year t = 2 Dividend at End of Q_1	Q_2	Q_3	Q_4
Annual Model									
Expected Quarterly Dividends	$.2358*	$.250	$.250	$.250	$.250	$.265	$.265	$.265	$.265
Implied Annual Dividends†	$.9432				$1.00				$1.06
Quarterly Model									
Implied Quarterly Dividend‡ if analysis date is . . .									
t_0, Q_4	$.2358*	$.239	$.243	$.246	$.250				
t_1, Q_1		$.250*	$.254	$.257	$.261	$.265			
t_1, Q_2			$.250*	$.254	$.257	$.261	$.265		
t_1, Q_3				$.250*	$.254	$.257	$.261	$.265	

*Actual dividend in quarter preceding analysis
†Total annual dividend (4 × Quarterly Dividend)
‡Implied four quarterly dividends are underlined

$$\$8.00 = \sum_{Q=1}^{4} \frac{\$.25}{(1+.19375)^{.25Q}} + \sum_{Q=1}^{4} \frac{\$.25(1.06)}{(1+.19375)^{1+.25Q}} + \ldots = \sum_{t=0}^{\infty} \sum_{Q=1}^{4} \frac{\$.25(1+.06)^{t}}{(1+.19375)^{t+.25Q}} \qquad (1a)$$

The same equity cost estimate is obtained from the reduced form Equation (2) DCF annual model if the D_1 measure is adjusted for the time value of dividends. As shown later, the D_1 value called for in the reduced form annual model is $1.06998 [$\$1.06998 = \sum_{Q=1}^{4} \$.25\,(1+.19375)^{1-.25Q}$] with a 19.375 percent opportunity cost to shareholders. The cost of equity after adjusting for the time value of dividends is

$$k = \frac{1.06998}{\$8.00} + .06 = .19375 \text{ or } 19.375\%.$$

Hence, the customary use of the annual DCF growth model understates the cost of equity capital for this firm by 88 basis points [19.375% − 18.50% = 0.875%] because the time value of money associated with the quarterly dividends and embodied in the market price of the stock is ignored.

Problems with the Quarterly Growth Model

As indicated above, one method of considering the timing of the quarterly dividends is to use the Equation (1) model in a quarterly mode. This formulation eliminates the time value of money problem associated with the unadjusted annual growth model. Unfortunately, common usage of a quarterly DCF model introduces a dividend bias since quarterly DCF models typically are formulated as

$$P_0 = \sum_{Q=1}^{\infty} \frac{D_{Q-1}(1+g_q)^{Q}}{(1+k_q)^{Q}}, \qquad (3)$$

where Q = number of quarters,
g_q = quarterly dividend growth rate, and
k_q = quarterly cost of equity rate.

This reduces to

$$P_0 = \frac{D_1}{k_q - g_q} = \frac{D_0(1+g_q)}{k_q - g_q} \qquad (4)$$

These formulations assume dividends are increased quarterly rather than periodically (typically annually). Thus, the quarterly dividend model correctly handles the time value of dividends but the quarterly dividend growth may cause the cost of equity capital to be understated or overstated.

The data in Exhibit 1 indicate clearly the reason for the bias in the quarterly model's equity cost estimates. The bottom four rows of Exhibit 1 present the implied quarterly dividends associated with a six percent annual dividend growth rate. The dividend stream denoted t_0, Q_4 assumes the analysis occurs at t = 0 or fiscal year end; stream t_1, Q_1 assumes the analysis is made after the first quarterly dividend, etc. The top row of Exhibit 1 shows the quarterly dividends actually expected. The discrepancies between the expected quarterly dividends (top row) and the dividends implied by the quarterly growth model (bottom four rows) depend upon when the DCF analysis is made relative to the fiscal year dividend policy change. For example, if the analysis is made immediately following the fiscal year-end, t_0, Q_4, the implied quarterly dividend is *less* than the actual dividend in three of the four quarters. However, if the analysis is made at the end of the first quarter, the implied quarterly dividend will be *greater* than the expected dividend in three of the four quarters. Similar discrepancies occur if the analysis is performed at the end of Q_2 or Q_3.

A Proposed Solution

Investors are fully aware of the quarterly payment schedule of dividends. Thus, the price, P_0, reflects the timing of the dividends as well as the amount of the dividends. If $(D_{t-1,Q1})$, $(D_{t-1,Q2})$, $(D_{t-1,Q3})$, and $(D_{t-1,Q4})$ represent the quarterly dividend payments at the end of the quarters in the year preceding the (t_0) date of analysis,[6] and dividends are expected to grow at an annual rate g, then P_0 can be written as

$$P_0 = \frac{(D_{t-1,Q1})(1+g)}{(1+k)^{.25}} + \frac{(D_{t-1,Q2})(1+g)}{(1+k)^{.50}} + \frac{(D_{t-1,Q3})(1+g)}{(1+k)^{.75}} + \frac{(D_{t-1,Q4})(1+g)}{(1+k)} + \sum_{t=1}^{\infty}\sum_{Q=1}^{4} \frac{D_{t,Q}(1+g)}{(1+k)^{t+.25Q}}. \quad (5)$$

This equation can be simplified to the $[k = (D_1/P_0) + g]$ annual model,

$$k = \frac{(D_{1,Q1})(1+k)^{.75}+(D_{1,Q2})(1+k)^{.50}+(D_{1,Q3})(1+k)^{.25}+(D_{1,Q4})}{P_0} + g. \quad (6)$$

Equation (6) shows that the DCF model expressed in an annual mode must include a time value of money adjustment to dividends when applied to the real world where dividends are paid quarterly rather than once a year.[7] Applying the Equation (6) annual model to the firm discussed earlier shows that investors' required rate of return is correctly assessed as 19.375 percent,

$$.19375 = \frac{\$.25(1+.19375)^{.75}+\$.25(1+.19375)^{.50}+\$.25(1+.19375)^{.25}+\$.25}{\$8.00} + .06,$$

or

$$.19375 = \frac{\$1.06998}{\$8.00} + .06$$

when quarterly dividends are adjusted to reflect the time value of money. This adjustment raises the estimate of the example firm's cost of equity some 88 basis points or from 18.50% to 19.375 percent. Thus, the time value of money adjustment to dividends is not trivial.

III. Market Required Rate of Return Vs. Allowed Return on Equity Rate Base

It is common practice in rate regulation to determine a utility's required quantity of earnings as the product of the DCF cost of equity measure and an equity rate base. The appropriateness of this procedure revolves around the rate year/rate base practices of regulatory agencies. This section demonstrates that a regulatory body's rate year/rate base practices may require that the market determined DCF equity cost estimate $[k_{mkt}]$ be adjusted to a regulatory allowed return $[k_{reg}]$ in order to estimate a utility's required quantity of earnings.

A review of the example firm discussed earlier will make clear why the (k_{mkt}) estimate may need to be adjusted before using it to estimate the required quantity of earnings. Recall that the example firm had the following characteristics

$$P_0 = \$8.00 \quad \overset{t_0}{D_{Q1}} = \$.25 \quad D_{Q2} = \$.25$$

$$D_{Q3} = \$.25 \quad D_{Q4} = \$.25 \quad \overset{t_1}{P_1} = \$8.48$$

and

$$k_{mkt} = .19375 \text{ or } [\$8.00 = (\sum_{t=1}^{4} \frac{D_{Qt}}{(1+.19375)^{t/4}}) + \frac{\$8.48}{(1+.19375)}].$$

For expository convenience, the t = 0 share price (P_0) is assumed to be equal to book value per share (BV_0), or

[6] Ex-dividend and dividend payment dates are important variables in the analysis. Equations (5) and (6) are developed under the assumption that the analysis date occurs immediately after a dividend payment. Given quarterly dividend payments, the time periods for which the time value of dividend adjustments are required are .75 year, .50 year, .25 year, and .00 year. A different set of time periods would be involved if the analysis occurred between dividend payment dates.

[7] The mathematical complexity of estimating k via Equation (6) can be reduced substantially by approximating the k in the numerator as $k = [4(D_{Q1,1})/P] + g$. This approximation technique causes k to be understated slightly. Additional iterations can determine the exact required return.

$P_0 = BV_0 = \$8.00$.[8] Were a regulatory body to estimate the quantity of required earnings as

$$\text{Required Earnings} = (k_{mkt})(BV_0) = (.19375)(\$8.00) = \$1.55$$

then equity investors will realize the 19.375 percent required market return only if the utility (1) retains all earnings and the share price increases in line with book value [$\$8.00 = (\$8.00 + \$1.55)/(1 + .19375)$], or (2) retains no earnings and pays out only a year-end \$1.55 annual dividend [$\$8.00 = \frac{\$1.55}{(1+.19375)} + \frac{\$8.00}{(1+.19375)}$]. This is nothing more than an example of the before-tax dividend irrelevance proposition.

But if the utility pays quarterly dividends, then the $[k_{mkt}][BV_0]$ product will overestimate the earnings requirement and, therefore, overestimate required revenues.[9] Consider the example firm once again. Assuming non-seasonal earnings and a share price equal to book value, the \$1.55 earnings requirement estimate will allow equity investors to achieve a 20.29 percent return [$\$8.00 = \sum_{t=1}^{4} \frac{\$.25}{(1+.2029)^{t/4}} + \frac{\$8.55}{(1+.2029)}$] which exceeds the market required return of 19.375 percent by over 90 basis points. The source of this anomaly is well known in the finance literature. It revolves around the reinvestment assumptions inherent in yield or internal rate of return analyses.

The confounding elements of the reinvestment problem can be easily handled, however, by explicitly introducing reinvestment assumptions. For example, the discrepancy between the realized and required returns disappears in the example above if the utility's after-tax earnings requirement is calculated as follows:

Step 1: Estimate the n period compounded equivalent of the annual market determined rate of return by

$$k_{mkt,n} = [1 + k_{mkt,annual}]^{\frac{1}{n}} - 1, \quad (8)$$

where n = number of compounding periods (if quarterly, n = 4).

Step 2: Use the rate of return from Step 1 and the beginning of each future period's equity rate base to calculate the earnings requirement for the year,

$$\begin{matrix}\text{Earnings Requirement} \\ \text{in Year Beginning at} \\ \text{Time of Analyses}\end{matrix} = \sum_{t=0}^{n-1} [k_{mkt,n}][(BV_n)_t], \quad (9)$$

where $(BV_n)_t$ = the equity book value at the beginning of each compounding period in the year following the analysis date.

Step 3: The regulatory allowed rate of return can be calculated by relating the equity earnings requirement (in year t) calculated in Step 2 to the (beginning of year t) rate base construct mandated by a regulatory commission.

$$k_{reg} = \frac{\text{Equity Earnings Requirement}}{\text{Equity Rate Base Measure}}. \quad (10)$$

Exhibit 2 shows that the appropriate annual after-tax earnings requirement for the example utility emerges as the product of the beginning of quarter equity rate bases and the annual DCF equity capital cost (19.375 percent) restated in its quarterly compounded equivalent (4.52697 percent). The resulting \$1.48 earnings requirement will provide equity investors the 19.375 required market return [$\$8.00 = (\sum_{t=1}^{4} \frac{\$.25}{(1+.19375)^{t/4}}) + \frac{\$8.48}{(1+.19375)}$].

Assuming the appropriate n in Equations (8) and (9) is four, the \$1.48 earnings requirement can be used to calculate k_{reg} for rate base measures other than a beginning of the year rate base (BV_0). For example, k_{reg} is 17.720522 (\$1.48/\$8.3519) percent if a year end rate base is used, and 18.24413 percent if a mid-test year rate base is employed (\$1.48/\$8.1122). And, of course, k_{reg} will be greater for an expanding utility than k_{mkt} if a historical rate base test year is employed.

It is worth noting that k_{reg} is 18.50 percent (\$1.48/\$8.00) when a beginning of the year rate base (BV_0) is used to estimate a utility's required quantity of earnings. This was the same rate obtained using the traditional annual DCF model uncorrected for the receipt of dividends received quarterly rather than a single year-end dividend payment. This fact should not be interpreted to mean that there really is no problem with the traditional annual growth DCF model. Rather, this equality is a unique happenstance that will occur if and

[8] One measure often used to indicate the efficacy of regulation is the price/book value ratio. The argument generally made is that when a utility has a P/BV = 1.0, the utility is earning the required return. The extent to which this measure is correct depends on how closely the book value reflects the economic value of the assets.

[9] It should be observed that the required earnings per share are on an after-tax basis. Revenue requirements are, of course, on a before-tax basis.

Exhibit 2. Required Earnings for Example Firm

Quarter	Book Value Beginning of Quarter	Earnings in Quarter t (.0452697)(BV_{Ot})	Dividends in Quarter t ($.25/quarter)	Retained Earnings in Quarter t (RE_t = EPS_t = DPS_t)	Book Value End of Quarter t ($BV_{O,t-1}$ + RE_t)
1	$8 0000	$ 3622	$ 2500	$ 1122	$8 1122
2	8 1122	3672	2500	1172	8 2294
3	8.2294	3725	2500	1225	8 3519
4	8 3519	3781	2500	1281	8 4800
		$1 4800			

only if: (1) the n variable in Equations (8) and (9) is equal to the frequency with which dividends are paid each year; (2) demand-revenues-earnings are non-seasonal; (3) the analysis occurs immediately following an ex-dividend date; and (4) the next n dividends are equal.[10] If any of these conditions are not met, then only a market determined equity cost measure [k_{mkt}] estimated via Equations (6) or (7) and converted to a regulatory allowed return on equity [k_{reg}] via Equations (8), (9) and (10) will correctly estimate a utility's level of required earnings. Unless the [k_{mkt}] estimate is converted to a regulatory allowed return [k_{reg}], the allowed return on equity may be misstated by 100 to 200 basis points.[11]

IV. The Irrelevance of the Frequency of Compounding

In recent years, some rate of return analysts have begun to argue that a DCF market determined annual rate of return should be converted to a continuously compounded rate. Such an adjustment causes the rate of return recommended to be 100–175 basis points lower, and leads to an understatement of the needed allowed return given the rate base constructs generally employed by regulatory commissions. However, use of a continuously compounded rate will not alter the estimate of a utility's required earnings and revenues if it is implemented employing a rate based construct consistent with continuous compounding.

The logic of why the frequency of compounding is irrelevant can be easily shown using the example firm. Recall that the beginning $8.00 price ($P_0$ = BV_0 = $8 00) emerges from investors' expectations that a $.25 dividend will be received at the end of each quarter and that the price at the end of the year will be $8 48[$P_1$ = BV_1 = $8.48 = $8.00(1 + g)]. This dividend-price configuration will provide investors with their required 19 375 percent annual holding period return. Whatever rate base-required return combination is used, the utility's required quantity of earnings is $1 48 during the year [4($ 25 quarterly dividend) + ($.48 increment to retained earnings)]. As shown in Exhibit 2, this means a utility must earn 4.52697 percent on its beginning of the quarter equity rate bases. Alternatively, using Equation (8), the allowed return can be stated on a monthly compounded basis or 1.48677 percent and used in conjunction with the beginning of the month equity rate bases. And, of course, the continuously compounded equivalent of shareholders' required 19.375 percent return or 17 70996 percent can be used *but* it must be applied to a rate base which increases continuously. That is,

$$\ln(1.19375) = .1770996128 = r_c$$

where r_c refers to the continuous compound rate. That the continuous compound rate of return generates the same $1.48 required quantity of earnings when the proper rate base measure is used, is shown in Exhibit 3. And shareholders realize their required 19.375 percent annual return since,

$$\$8.00 = \frac{\$.25}{e^{.25r_c}} + \frac{\$.25}{e^{.50r_c}} + \frac{\$.25}{e^{.75r_c}} + \frac{\$.25}{e^{r_c}} + \frac{\$8.48}{e^{r_c}}$$

$$= \frac{\$.25}{(1+.19375)^{.25}} + \frac{\$.25}{(1+.19375)^{.50}} + \frac{\$.25}{(1+.19375)^{.75}} + \frac{\$.25}{(1+.19375)} + \frac{\$.25}{(1+.19375)}$$

[10] In passing, it should be pointed out that the same intra-year compounding problem exists in connection with the calculation of the cost of a utility's embedded debt. Conventional practice of both utilities and regulatory commissions is to calculate a utility's embedded debt cost as the weighted average of the coupon yields ($k_{i:coupon}$) of outstanding bond issues rather than to calculate a weighted average of the yields-to-maturity ($k_{i:ytm}$) (with $P_0 = P_t$ = $1000) that gives recognition to intra-year compounding. Interestingly, ignoring intra-year compounding does not create the serious bias problem in the cost of debt measure that it does with respect to the cost of equity estimate. This is because $k_{i:reg} = k_{i:coupon} = n[(1 + k_{i:ytm})^{1/n} - 1]$ when n is two, $P_0 = P_t$ = $1000, and the semi-annual interest payment is level.

[11] A *caveat* is in order inasmuch as this presentation abstracts from various realities in the regulatory process. For example, a regulatory commission may choose to exclude specific assets from a utility's rate base, or not allow certain expenses to be recovered. However, introduction of these regulatory realities would not alter the conclusions reached in the paper regarding the proper procedures to be followed in implementing a DCF analysis of equity capital cost in rate regulation.

Exhibit 3. Required Earnings for Example Firms Using Continuous Compounding

Quarter	Beginning of Period BV	$\times e^{.25rc}$	=	End of Period $BV_{Q,t}$ Before Dividends	Quarterly Earnings $(BV_{Q,T} - BV_{Q,t-1})$	−	Quarterly Dividend	=	Retained Earnings in Quarter t
1	$8.0000	$\times e^{.25rc}$	=	$8.3622	$.3622	−	$.2500	=	$.1122
2	8.1122	$\times e^{.25rc}$	=	8.4794	.3672	−	.2500	=	.1172
3	8.2294	$\times e^{.25rc}$	=	8.6019	.3725	−	.2500	=	.1225
4	8.3519	$\times e^{.25rc}$	=	8.7300	.3781	−	.2500	=	.1281
5	8.4800								
					$1.4800		$1.0000		$.4800

Required Earnings = $1.48 = $1.0000 Dividends + $0.4800 Capital Gain or $\Delta BV(\Delta P)$

Thus, the frequency of compounding is irrelevant as long as the rate base construct employed in calculating a utility's required earnings is consistent with the assumptions inherent in the rate of return employed.

V. Summary

The annual DCF models typically encountered in financial texts, rate hearings, and empirical financial research do not treat correctly the timing of dividends. Also, the market determined DCF cost of equity estimate must generally be adjusted before it can be applied to a regulatory rate base. This paper illustrates the bias arising from conventional DCF analyses and presents a simple adjustment to the DCF model which eliminates the timing of dividend problem. In addition, the appropriate procedure for adjusting a market determined rate of return to a regulatory allowed rate of return is presented. Finally, the frequency of compounding used in a DCF analysis is shown to be irrelevant.

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The Irrelevance of Compounding Frequency in Determining a Utility's Cost of Equity

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I. Introduction

The relevance of the frequency of compounding in utility rate regulation is often misunderstood. Increasingly, analysts have advocated that the allowed return on equity capital should be the quarterly or continuously compounded equivalent of the market determined annual rate of return estimate emerging from a discounted cash flow (DCF) analysis. Of course, restating an annual rate of return in terms of its quarterly or continuously compounded equivalent creates a lower return measure. If this lower return were applied to an unchanged rate base, the resulting estimates of the utility's earnings and revenue requirements would also be lower. However, the use of a quarterly or continuously compounded rate will not alter the estimate of a utility's annual earnings requirement as long as it is implemented with a rate base construct that is consistent with quarterly or continuous compounding. That is, regardless of the frequency of compounding, the allowed rate of return and, hence, service rates must be set at levels that are expected to generate the quarterly dividends and growth in investment (share price) required by investors.

Linke-Zumwalt [1] and Siegel [2] have explored the effect on capital cost estimation when recognition is given to the fact that firms commonly pay dividends quarterly but change the dividend amount only periodically. Both articles demonstrated that the market return estimate based on quarterly dividends is higher than the traditional DCF model [$k_e = (DPS_1/P_0) + g_{dps}$] return estimate when DPS_1 is a simple sum of the next four quarterly dividends. Linke and Zumwalt (L-Z) also showed that the market determined DCF equity cost estimate should be adjusted to a regulatory allowed return in order to estimate a utility's required amounts of earnings and revenues.

L-Z went on to argue that this required adjustment is independent of the frequency of compounding (annual, monthly, quarterly or continuous) assumption embodied in the return estimate. Siegel, on the other

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Exhibit 1. Siegel's Example Utility Data

Analysis Date	Beginning of quarter 1 in year 1
Price/Share (P)	Equal to book value/share (BVPS)
Beginning-of-quarter Dividends/Share (DPS)	\$ 1.50 quarterly in year 1 \$ 1.62 quarterly in year 2
Annual Growth (g)	8.0% for DPS, BVPS and P
Beginning-of-year Price/Share	\$50.00
End-of-year Price/Share	\$54.00 or \$50(1.08)
Payout Ratio	0.60 calculated on an annual basis

$Quarter_{t,q}$	$Q_{1,1}$	$Q_{1,2}$	$Q_{1,3}$	$Q_{1,4}$	$Q_{2,1}$	$Q_{2,2}$
Dividend/Share	\$1.50	\$1.50	\$1.50	\$1.50	\$1.62	\$1.62
Price/Share	\$50.00				\$54.00	

hand, argued that the earnings requirement for common equity ". . . must be discounted at the continously compounded rate of return rather than the discrete, per period return" [2, p. 51]. This article reconciles the apparent differences in these conclusions and demonstrates that, when the proper rate base construct is used, the frequency of compounding is irrelevant in utility rate regulation.

II. Irrelevance of the Frequency of Compounding

Siegel's conclusion that continuous compounding must be used by regulators emerges from his assumption that the earnings of a utility are received continuously over time. However, the time configuration of earnings does not dictate that regulators must employ continuous compounding to estimate the annual earnings requirement for a utility. This is not to say that continuous compounding is an inappropriate method. Rather, the point is that annual, quarterly, monthly or continuously compounded rates equivalent to investors' annual required return will provide the same estimate of the annual earnings requirement for a utility *if* the compounding assumptions of the rate of return measure and the rate base measure are consistent. This can be easily shown using Siegel's example utility data (see Exhibit 1).

The example utility provides shareholders with \$6.00 of dividends and \$4.00 price appreciation and, therefore, a market determined DCF annual required return of 21.57892%.[1] This is equivalent to a discrete quarterly rate of return of 5.00611% and a continuously compounded annual rate of return (r_c^a) of 19.53934%.[2] Siegel indicates the continuously compounded rate of return should be used to calculate the example utility's annual earnings requirement (R^a) as shown in his Equation (13),

$$R^a = r_c^a P_0 = (0.1953934)(\$50) = \$9.769671.^3$$

This estimate of R^a, the annual earnings requirement of the example utility, is too small to provide shareholders their \$6.00 of dividends and \$4.00 price (book value) appreciation during year one. However, if earnings on reinvested earnings are included, the \$9.769671 estimate is, in fact, too large.[4] The earnings

[1] $$\$50.00 = \sum_{q=0}^{3} \frac{1.50}{(1.2157892)^{0.25q}} + \frac{\$54.00}{(1.2157892)}$$

[2] The continuous annual rate (r_c^a) that is equivalent to the 0.2157892 discrete annual rate of return (r_d^a) is

$$r_c^a = \ln(1 + r_d^a) = \ln(1.2157892) = 0.1953934$$

The discrete quarterly rate of return is

$$r_d^q = (1 + r_d^a)^{0.25} - 1 = (1.2157892)^{0.25} - 1 = 0.0500611,$$

while the continuous quarterly rate is

$$r_c^q = \ln(1 + r_d^q) = \ln(1.0500611) = 0.0488484$$

[3] In his footnote 9, Siegel offers a second calculating procedure when earnings of the utility are assumed to grow at a continuous rate (g_c). Specifically,

$$\begin{aligned} R^a &= R_0 e^{(g_c)(1)} \\ &= [(r_c^a - g_c^a)P_0][e^{(g_c)(1)}] \\ &= [(0.19539341 - 0.076961)\$50][1.08] \\ &= \$6.3955 \end{aligned}$$

Using this formulation, the earnings requirement for Siegel's example utility would be only \$6.3955, drastically short of the \$10.00 needed if shareholders are to receive their \$6.00/share of dividends and \$4.00 price (book value) per share appreciation.

This calculating procedure would appear to be applicable to Siegel's example utility which is assumed to experience an 8.0% annual growth in its equity rate base and earnings. This alternative calculation is incorrect because there is no earnings growth that Siegel has not fully considered in his Equation (13) estimation procedure.

[4] Siegel defines the annual equity earnings requirement (R^a) for a utility to be the earnings ". . . from rate payers plus interest and dividends

Exhibit 2. Earnings on Beginning Rate Base and Reinvested Earnings for Example Utility (Continuous Compounding)

Quarter	Beginning of Quarter Book Value (1)	Dividend Paid at Beginning of Quarter (2)	Beginning of Quarter Book Value after Dividend Payment (3)=(1)−(2)	Earnings in Quarter $(4)=(3)(e^{r_c^a/4}-1)$	Book Value at End of Quarter (5)=(3)+(4)
1	$50.0000	$1.50	$48.5000	$ 2.4280	$50.9280
2	50.9280	1.50	49.4280	2.4744	51.9024
3	51.9024	1.50	50.4024	2.5232	52.9256
4	52.9256	1.50	51.4256	2.5744	54.0000
		$6.00		$10.0000	

Composition of Earnings	Earnings in Quarter q (E_q)*				Total*
	E_1	E_2	E_3	E_4	(ΣE_q)
A. Earnings during Quarter on $48.50† Beginning of Period Rate Base	$2.3691	$2.3691	$2.3691	$2.3691	$ 9.4766
B. Earnings on Earnings Reinvested during Quarter	0.0588	0.0588	0.0588	0.0588	0.2353
Subtotal: Earnings during Quarter on Beginning of Period Rate Base	$2.4280	$2.4280	$2.4280	$2.4280	$ 9.7119
C. Earnings during Quarters 2, 3 and 4 on Quarter 1's Excess Earnings‡		0.0464	0.0488	0.0512	0.1464
D. Earnings during Quarters 3 and 4 on Quarter 2's Excess Earnings‡			0.0464	0.0488	0.0952
E. Earnings during Quarter 4 on Quarter 3's Excess Earnings‡				0.0460	0.0460
	$2.4280	$2.4744	$2.5232	$2.5744	$10.0000

*Details may not sum to totals due to rounding.
†The beginning-of-period equity rate base is $48.50 inasmuch as the $50.00 (price) book value per share is reduced to $48.50 when the $1.50 beginning-of-quarter 1 dividend is paid.
‡The term "excess earnings in quarter" refers to earnings during a quarter in excess of the end-of-quarter dividend.

data shown in Exhibit 2 for the example utility reveal why this is so.

The upper panel of Exhibit 2 shows the quarter-by-quarter and annual earnings requirement of the example utility using continuous compounding.[5] As can be seen, the $10.00 of earnings generated over the year provide shareholders with $6.00 of dividends and a $4.00 increase in price (book value per share).

The lower panel of Exhibit 2 decomposes the $10.00 annual earnings requirement into (i) earnings on the beginning-of-period rate base or the rate base implicit in a DCF analysis, and (ii) earnings on reinvested earnings. Row A shows the quarterly earnings associated with the $48.50 beginning-of-period rate base. Row B shows the earnings generated during a quarter due to the reinvestment during that quarter of the continuously generated earnings. Rows C, D, and E identify the earnings in subsequent quarters due to the reinvestment of previous quarters' earnings after payment of quarterly dividends.

These reinvested earnings *must* earn shareholders'

from securities owned [earnings on reinvested earnings] less all operating expenses and payments of interest on debt and dividends on preferred stock outstanding" [2, p. 51]. Later in the same paragraph when discussing the calculation of R^a, Siegel states that R^a must be estimated as $R^a = r_c^a P_0$ because the utility receives earnings continuously and this ". . . allows the firm to earn an additional rate of return on its revenue [earnings] before it disburses funds [quarterly dividends] to shareholders, [thereby] lowering the annual revenue [*i.e.*, earnings] requirement below the level that would exist if the firm obtained revenue [*i.e.*, earnings] allotments at the end of the quarter" [2, p. 51].

[5]Implicit in the Exhibit 2 data is the assumption that the utility receives earnings through the continuous sale of service and is able to reinvest these earnings instantaneously at r_c^a.

Exhibit 3. Earnings on Beginning Rate Base and Reinvested Earnings for Example Utility (Quarterly Compounding)

Quarter	Beginning of Quarter Book Value (1)	Dividend Paid at Beginning of Quarter (2)	Beginning of Quarter Book Value after Dividend Payment (3) = (1) − (2)	Earnings in Quarter (4) = (3) × (r_d^q)	Book Value at End of Quarter (5) = (3) + (4)
1	$50.0000	$1.50	$48.5000	$ 2.4280	$50.9280
2	50.9280	1.50	49.4280	2.4744	51.9024
3	51.9024	1.50	50.4024	2.5232	52.9256
4	52.9256	1.50	51.4256	2.5744	54.0000
		$6.00		$10.0000	

Composition of Earnings	Earnings in Quarter q (E_q)* E_1	E_2	E_3	E_4	Total (ΣE_q)
Earnings during Quarter on $48.50† Beginning of Period Rate Base	$2.4280	$2.4280	$2.4280	$2.4280	$ 9.7120
Earnings during Quarters 2, 3 and 4 on Quarter 1's Excess Earnings‡		0.0464	0.0488	0.0512	0.1464
Earnings during Quarters 3 and 4 on Quarter 2's Excess Earnings‡			0.0464	0.0488	0.0952
Earnings during Quarter 4 on Quarter 3's Excess Earnings‡				0.0464	0.0464
	$2.4280	$2.4744	$2.5232	$2.5744	$10.0000

*E_q = (r_d^q or 0.05006115) (beginning-of-quarter investment)
†The beginning-of-period equity rate base is $48.50 inasmuch as the $50.00 (price) book value per share is reduced to $48.50 when the $1.50 beginning-of-quarter 1 dividend is paid.
‡The term "excess earnings in quarter" refers to earnings during a quarter in excess of the end-of-quarter dividend.

required return in order to generate the necessary $10.00 of annual earnings. The earnings data reveal that the utility requires service rates that provide it the opportunity to earn only $9.4766 from the sale of services generated by its beginning-of-period rate base. The $0.5234 difference between the $10.00 annual earnings requirement and the $9.4766 earnings from the sale of services generated by the $48.50 beginning-of-period rate base comes from earnings on reinvested earnings.

Alternative rate-of-return measures that are equivalent to investors' annual required return will provide estimates of the utility's quarter-by-quarter and annual earnings requirement that are identical to the estimates obtained using continuous compounding. The upper and lower panels of Exhibit 3 show the calculation of the $10.00 earnings requirement using quarterly compounding for both the rate-base measure and investors' required return. As can be seen, the application of the quarterly equivalent of the 21.57892% annual required return measure to the beginning-of-quarter rate base values provides for the four $1.50 quarterly dividends and the $54.00 ending book value (price). Also, as in the continuous compounding calculations shown in Exhibit 2, the payout ratio is 60% and the growth in book value (price) conforms to the 8.0% annual growth rate assumption.

As shown in Exhibits 2 and 3, and in the L-Z article, the quarter-by-quarter and annual earnings requirements of the example utility are identical whether the estimates are based on annual, quarterly or continuous compounding. Thus, it is not necessary that the annual earnings requirement for a utility's common equity be estimated using continuous compounding.

Note, however, that when specifying his R^a calculating procedure, Siegel altered his working definition of R^a so as to exclude earnings on reinvested earnings. He then separated the proportion of the annual $10.00 earnings requirement that customers must provide through the prices they pay for service generated by the beginning-of-period equity rate base from the proportion of the annual earnings requirement that will be earned on reinvested earnings.[6] If, as Siegel assumed, the utility receives its revenues and earnings continuously over the year and can instantaneously reinvest earnings at r_c^a, then customers need to pay service prices that provide only $9.4766 (see row A of lower panel of Exhibit 2) of earnings on the generating capacity in place at the beginning of the period. If it is believed, on the other hand, that the utility will only be able to invest earnings in excess of dividends quarterly, rather than instantaneously, then customers need to pay prices for the service generated by beginning-of-period capacity that will provide $9.7120 (see Exhibit 3) in earnings over the year. And, of course, if it is judged by the regulatory body that the utility will only be able to reinvest its earnings annually at investors' required return, then customers must pay prices that will provide the entire $10.00 of required earnings.[7]

III. Concluding Observations

Setting the allowed rate of equity return in public utility regulation requires that two very different rate of return concepts be distinguished — the required market (economic) return and the regulatory allowed (accounting) return. Investors' annual required rate of return is a market determined return that reflects both the amount and timing of expected cash flows from dividends and price appreciation to the beginning-of-period investment (price). The regulatory allowed rate of return is a percentage accounting return that emerges when the required quantity of earnings a utility needs to earn, if shareholders are to realize their expected market return, is related to a historical or future test year equity rate base.

Rate of return analysts' DCF estimates of the market required return must be converted into a regulatory allowed return if a utility's earnings requirement is to be correctly estimated. This article has shown that the estimation of a utility's annual earnings requirement is not affected by the frequency of compounding assumed in a DCF analysis. As long as the investment or rate base construct used to estimate the required quantity of earnings is consistent with the compounding assumption implicit in the rate of return measure, the estimated required quantity of earnings and, thus, the regulatory allowed return [(required quantity of earnings)/(regulatory rate base)] are identical whether a continuous or a discrete compounding analysis is undertaken.

[6]The service rates established during a rate hearing will allow shareholders to earn their required market return in the future if it can be safely assumed that: (i) the required market return does not change; (ii) the post rate hearing unit demand relative to productive capacity is unchanged; (iii) the [(operating costs per unit output)/(authorized service rate per unit output)] ratio does not change over time; and (iv) the average total investment and average equity investment per unit of capacity does not change over time. These assumptions may have worked tolerably well in the 1950s and 1960s. However, developments in the 1970s and 1980s, particularly inflation, changed the reasonableness of these crucial assumptions and fostered the increased volume of rate hearings.

[7]The appropriate reinvestment rate to use in an analysis of the earnings requirement for a utility will be affected by such variables as seasonality of revenues and earnings, the rate of growth and timing of capital expenditures and the rate base measure. This means, of course, that the appropriate reinvestment rate may range from zero up to investors' required return, and is, ultimately, an empirical issue.

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An N-Stage, Fractional Period, Quarterly Dividend Discount Model
Brooks, Robert; Helms, Billy
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An *N*-Stage, Fractional Period, Quarterly Dividend Discount Model

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Abstract

This paper develops a dividend discount model that will allow as many growth stages as desired. The model is directly applicable to most common stocks in that quarterly dividends are assumed and you need not be on a dividend payment date. The equation is easily programmed into a computer and is computationally very fast. The Newton-Rhapson algorithm is suggested as a means for estimating the required rate of return.

Introduction

The development of dividend discount models (DDMs) beyond the constant growth model has been limited to the two- and three-stage models. The two-stage model was developed by Malkiel [13], and the three-stage model was developed by Molodovsky [14]. The primary reason for not going further than three stages has been the difficulty of estimating the appropriate parameters. (See, for example, Elton and Gruber [5].) Another reason for limiting the development of the DDMs to three or fewer stages is the computational difficulty. The literature related to DDMs is vast. A brief summary includes [1, 3, 6–10, 15, 16].

The purpose of this paper is to provide a simple analytical equation that can handle as many stages as the analyst will brave to estimate. Thus, the analyst can decide the limits with regard to the number of stages rather than being constrained by the model. Also, the model presented here is directly applicable to actual stock price data as it assumes quarterly dividends and fractional periods.

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The Model

The N-stage model presented is based on the assumption that the stages are of the Malkiel type [13] and not of the Molodovsky type [14]. That is, within each stage, dividends grow at a constant rate. The N-stage model is also based on the assumption that dividends are adjusted once a year with the first adjustment beginning h quarters from now, and quarterly compounding as opposed to annual compounding is assumed.

If dividends are paid quarterly, it is imperative that quarterly compounding be used in any model. Therefore, if annual rate k is used, the appropriate rate on a quarterly basis is

$$r = (1 + k)^{1/4} - 1.$$

The errors associated with using $k/4$ instead of r are well documented by Chew and Clayton [2], Horvath [11], and Lindley, Helms, and Haddad [12]. That is, if k is indeed the annual rate of return, large errors result from not using a model that assumes quarterly compounding.

The N-stage, fractional period, quarterly dividend discount model is as follows: (The derivation of this model is available from the authors upon request.)

$$P = Q(DF^{-f})\left[T + (DF^{h})Z\left\{\sum_{m=1}^{N}\left(\prod_{j=1}^{m-1} B_j^{n_j}\right)S_m\right\}\right] \quad (1)$$

where

Q = last quarterly dividend paid,
DF = $1/(1 + k)^{1/4}$ (the discount factor for one quarter)

where

k = required rate of return (annual),
f = fraction of current *quarter* elapsed since last dividend payment,
T = $(1 - DF^{h})/[(1 + k)^{1/4} - 1]$,
h = number of quarters until a change in dividend policy,
N = number of growth stages,
Z = $DF^{-3} + DF^{-2} + DF^{-1} + 1$,
B_j = $(1 + g_j)DF^{4} = (1 + g_j)/(1 + k)$,

g_j = growth rate of dividends for stage j, $j = 1, 2, \ldots, N$,
n_j = number of years for the jth stage growth rate,
$S_N = (1 + g_N)/(k - g_N)$
$S_m = n_m\, I(B_m = 1.0) + NE_m\, I(B_m \neq 1.0)$ for $m = 1, 2, \ldots, N - 1$,

where $I(\cdot)$ is an indicator function—if the statement within the parentheses is true, then $I = 1.0$, otherwise $I = 0.0$,

$$NE_m = (1 - B_m^{n_m})\,(1 + g_m)/(k - g_m).$$

Also, assume $\prod_{j=1}^{0} B_j^{n_j} = 1.0$.

If $N = 0$, then dividends will remain constant, and thus $h = \infty$ and $DF^h = 0.0$. Therefore, equation (1) reduces to

$$P = Q(DF^{-f})T$$
$$P = Q(DF^{-f})/[(1 + k)^{1/4} - 1].$$

If $N = 1$, then $k > g_1$ (or else the price is infinite), and $n_1 = \infty$; thus $S_1 = NE_1 = (1 + g_1)/(k - g_1)$ and equation (1) reduces to

$$P = Q(DF^{-f})\,[T + (DF^h)\,Z(S_1)]$$
$$P = Q(DF^{-f})\,[T + (DF^h)Z(1 + g_1)/(k - g_1)].$$

If $N = 2$, then $k > g_2$, thus $S_2 = (1 + g_2)/(k - g_2)$ and

$$P = Q(DF^{-f})\,[T + (DF^h)Z\{S_1 + B_1\,(1 + g_2)/(k - g_2)\}].$$

For $N > 2$, then $k > g_N$, and equation (1) can be applied.

The Required Rate of Return

When implementing this model, the current market price is easily observable. In this section, we sketch the methodology for estimating k (the annual required rate of return) using the standard Newton-Rhapson method. The Newton-Rhapson method (see Ellis [4]) is an iterative technique that is easily programmable. The following is an outline of the Newton-Rhapson approach to solving for k in our model.

Step 1. Estimate $k_i = (4Q/P) + g_N$, which is the first estimate of k where $i = 1$ (i is a counter). Any reasonable estimate of k is acceptable. This estimate assures $k_1 > g_N$.

Step 2. Calculate $P(k_i)$, the price based on k_i.

Step 3. Calculate

$$\left.\frac{dP}{dk}\right|_{k=k_i} \equiv P'(k_i),$$

which is the first derivative of price with respect to k and evaluated at k_i. The appropriate derivative is given in equation (2) below.

Step 4. Calculate $k_{i+1} = k_i - ((P(k_i) - P)/P'(k_i))$, an improved estimate of k.

Step 5. Test to make sure $k_{i+1} > 0$ for $N = 0$ and $k_{i+1} > g_N$ for $N > 0$, a rational estimate of k. The Newton-Rhapson method works well as long as the price based on k_{i+1} is not too small or too large.

Step 6. Calculate $P(k_{i+1})$, the price based on k_{i+1} and test accuracy of k_{i+1} to compute the observed price. That is,

IF ($|P(k_{i+1}) - P| < \epsilon$) THEN
$k = k_{i+1}$ and quit for acceptable ϵ (say $\epsilon = 0.001$).

Step 7. If k_{i+1} is not precise enough, then set $i = i + 1$ and go to Step 3.

The only problem in implementing the Newton-Rhapson method is solving for $P'(k_i)$.

$$\frac{dP}{dk} = [Qf(DF^{4-f})/4]\left[T + (DF^{h})Z\left\{\sum_{m=1}^{N}\left(\pi_{j=1}^{m-1} B_j^{n_j}\right)S_m\right\}\right]$$
$$+ Q(DF^{-f})\Big[\{h(DF^{h+4})[(1+k)^{1/4} - 1]$$
$$- (1 - DF^{h})(1+k)^{-3/4}\}/(4[(1+k)^{1/4} - 1]^2)$$
$$- \left(h(DF^{h+4})/4\right)Z\sum_{m=1}^{N}\left(\pi_{j=1}^{m-1} B_j^{n_j}\right)S_m$$
$$- (DF^{h})(DF^{6}/4)(3DF^2 + 2DF + 1)\sum_{m=1}^{N}\left(\pi_{j=1}^{m-1} B_j^{n_j}\right)S_m \qquad (2)$$

$$+ (DF^h)Z\left(\sum_{m=1}^{N}\left(\prod_{j=1}^{m-1}(1+g_j)^{n_j}\right)\right.$$

$$\times\left\{-\left(\sum_{i=1}^{m-1}n_i\right)(1+k)^{-\left(\sum_{i=1}^{m-1}n_i\right)-1}S_m\right.$$

$$+(1+k)^{-\left(\sum_{i=1}^{m-1}n_i\right)-1}\Big[OI(B_m=1.0)$$

$$+(1+g_m)\Big\{n_m B_m^{n_m-1}(1+k)^{-2}(k-g)$$

$$\left.\left.-(1-B_m^{n_m})\Big\}/(k-g_m)^2 I(B_m\neq 1.0)\Big]\right\}\right)\Big].$$

Example

Consider the case of Commonwealth Edison Company (CWE), which supplies electricity to an estimated population of 8,000,000 in an 11,525 square mile area in northern Illinois. Approximately 33 percent of sales are derived from the Chicago area with 77 percent of the power generated by nuclear and 22 percent by coal. (See *Valueline*, April 21, 1989). CWE has paid quarterly dividends of \$0.75 since 1982. The closing price on June 9, 1989, was 37 5/8, the last dividend was paid on May 1, 1989, and the next dividend will be paid on August 1, 1989. (See *Barron's*, June 12, 1989.)

Three estimates are made of the required rate of return to illustrate the advantage of the dividend discount model presented here: (a) annual dividends, no fractional periods; (b) quarterly dividends, no fractional periods; and (c) quarterly dividends, fractional periods (the model presented here).

Case 1: No Growth. If we assume that CWE will only be able to maintain their \$3.00 per year dividend and thus no growth in dividends is anticipated, the required rates of return are as follows: (Note that $f = 39/92$, $Q = \$0.75$, and $P = \$37\ 5/8$.)

Compound Period	Fractional Periods?	Required Rate of Return
(a) Annual	No	7.973%
(b) Quarterly	No	8.215%
(c) Quarterly	Yes	8.287%

Thus, we see that by assuming annual periods and ignoring the fractional period, we produce an estimate of the required rate of return that is off by 31.4 basis points ((8.287 − 7.973) × 100). Assuming quarterly compounding but ignoring the fractional period produced an error of 7.2 basis points ((8.287 − 8.215) × 100). This error is not that great partly due to being only 39 days through the quarter.

Case 2: Constant Growth. If we assume that CWE's dividends will grow at 3 percent per year ($g = 0.03$) after year end ($h = 2$), then we have the following required rates of return:

Compound Period	Fractional Periods?	Required Rate of Return
(a) Annual	No	11.213%
(b) Quarterly	No	11.429%
(c) Quarterly	Yes	11.530%

Again, we see the downward bias of ignoring quarterly compounding as well as fractional periods. The exact downward bias of more complex cases is a function of the parameters selected.

Summary

The dividend discount model developed incorporates quarterly dividends, fractional periods, and N stages. This model alleviates the need to use a one- or two-stage model to estimate future dividends for the more realistic cases where expected changes in dividend policy do not occur at convenient annual time periods and dividend policy is expected to change more than once or twice. The N-stage, fractional period, quarterly dividend discount model presented provides greater precision and more flexibility than previous models. In addition, an efficient procedure is given for estimating the required rate of return.

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KENTUCKY-AMERICAN WATER COMPANY
CASE NO. 2007-00143
ATTORNEY GENERAL'S REQUEST FOR INFORMATION

Item 4 of 312

Witness: Dr. James H. Vander Weide

4. RE: Vander Weide Direct Testimony. With respect to page 18, lines 10-16, please indicate:

   (a) Why Dr. Vander Weide has chosen to use the earnings forecasts reported by I/B/E/S and not another service like Zack's or First Call?,

   (b) How does the analysts coverage of I/B/E/S compare to the analysts coverage of the other major earnings reporting services?, and

   (c) Are the I/B/E/S earnings forecasts available free of charge on the Internet and, if so, where?

Response:

a) I chose to use the I/B/E/S earnings growth forecasts rather than those of another service such as Zack's or First Call because: (1) I have performed statistical studies that demonstrate that the I/B/E/S growth estimates are highly correlated with companies' stock prices; (2) in my experience over the past 25 years, the I/B/E/S forecasts have superior availability of historical coverage, estimates for more companies, and more contributing analysts' estimates; (3) the I/B/E/S data have been more widely studied in the academic literature; and (4) I/B/E/S also provides other financial information such as revenue/sales, net income, pre-tax profit, and operating profit. I did not include Zack's or First Call in addition to I/B/E/S because there is considerable overlap in the analysts contributing to the I/B/E/S, Zack's, and First Call surveys, and because I/B/E/S and First Call are now owned by the same firm, Thomson Financial; thus, I/B/E/S and First Call long-term growth estimates should be identical.

b) The I/B/E/S data represents a consensus of annual and long-term forecasts collected from 60 data researchers and 9,000 contributing analysts, and the I/B/E/S data contain historical earnings estimates for more than 35,000 companies worldwide, with U.S. data beginning in 1976 and international data beginning in 1987. Detailed First Call consensus estimate data is confined to U.S. and Canadian companies. I have been unable to find current information from Zack's on the numbers of analysts' providing long-term earnings growth forecasts.

c) Yahoo Finance reports earnings estimates free of charge that it lists as being obtained from Thomson/First Call. However, these data do not include detailed information relating to whether the estimates are means or medians; the time the estimates were supplied; the number of or identity of the analysts contributing to the estimates; the value of each analyst's estimate; or the standard deviation or coefficient of variation among the estimates.

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KENTUCKY-AMERICAN WATER COMPANY
CASE NO. 2007-00143
ATTORNEY GENERAL'S REQUEST FOR INFORMATION

Item 5 of 312

Witness: Dr. James H. Vander Weide

5. RE: Vander Weide Direct Testimony. With respect to page 19, lines 3-8, please provide of all studies known to Dr. Vander Weide which indicate that "I/B/E/S growth rates are widely used by institutional and other investors."

Response:

My use of analysts' forecasts to estimate the growth component of the DCF model is based on the results of my own studies rather than on the results of studies reported in the literature. As a result, I have not attempted to find all studies that indicate that investors use analysts' forecasts to estimate future earnings growth. However, I am aware of several articles that investigate the relationship between analysts' forecasts and stock prices. The strong correlation between analysts' forecasts and stock prices found in these articles indicates that investors use the analysts' growth forecasts to estimate future earnings growth. See the attached. See also, Cragg, John G. and Burton G. Malkiel, *Expectations and the Structure of Share Prices*, National Bureau of Economic Research, University of Chicago Press, 1982.

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THE CONSENSUS AND ACCURACY OF SOME PREDICTIONS OF THE GROWTH OF CORPORATE EARNINGS

J. G. CRAGG* AND BURTON G. MALKIEL*

FOR YEARS ECONOMISTS HAVE EMPHASIZED the importance of expectations in a variety of problems.[1] The extent of agreement on the significance of expectations is almost matched, however, by the paucity of data that can be considered even reasonable proxies for these forecasts. One area in which expectations are highly important is the valuation of the common stock of a corporation. The price of a share is—or should be—determined primarily by investors' current expectations about the future values of variables that measure the relevant aspects of corporations' performance and profitability, particularly the anticipated growth rate of earnings per share.[2] This theoretical emphasis is matched by efforts in the financial community where security analysts spend considerable effort in forecasting the future earnings of companies they study. These forecasts are of particular interest because one can observe divergence of opinion among different individuals dealing with the same quantities. This paper is devoted to the analysis of a small sample of such predictions and certain related variables obtained from financial houses.[3]

I. NATURE AND SOURCES OF DATA

The principal data used in this study consisted of figures representing the expected growth of earnings per share for 185 corporations[4] as of the end of 1962 and 1963. These data were collected from five investment firms. The participants were recruited through requests to two organizations. One was a group of firms who used computers for financial analysis and who met periodically to discuss mutual problems, the other was the New York Society of

* University of British Columbia and Princeton University, respectively. This Research was supported by the Institute for Quantitative Research in Finance, the National Science Foundation, and the Graduate School of Business, University of Chicago. We are indebted to Paul Cootner for helpful comments.

1. A number of studies of anticipations data have been collected in two National Bureau Volumes [12] and [13]. Some more recent work on the assessment of expectations or forecasts has been done by Zarnowitz [16].

2. The classic theoretical statement of the anticipations view of the determination of share valuation may be found in J. B. Williams [15]. This position is also adopted in the standard textbook in the field [3]. The emphasis on the importance of earnings growth may also be found in [4], [5], and [19].

3. One of the few attempts to conduct a study of this type was made by the Continental Illinois Bank and Trust Company of Chicago [1] in 1963. The bank collected a sample of earnings estimates one year in advance from three investment firms. An analysis of these projections revealed that the financial firms tended to overestimate earnings and that over-all quality of the estimates tended to be poor.

4. The 185 companies for which the growth-rate estimates were made tended to be the large corporations in whose securities investment interest is centered. This selection was made on the basis of availability of data and was not chosen as a random sample.

Financial Analysts. As a result, eleven firms agreed to participate in the proposed study. From the original eleven, however, only five were able to supply comparable sets of long-term earnings forecasts for use in this study.[5] Even among these five there was not complete overlap in the corporations for which predictions were available. One of them had no data for 1962. For only two were data available for the full set of 185 companies.

Of the five participating firms, two are large New York City banks heavily involved in trust management, one is an investment banker and investment adviser doing mainly an institutional brokerage business, one is a mutual fund manager, and the remaining firm does a general brokerage and investment advisory business. We would not argue that these estimates give an accurate picture of general market expectations. It would, however, seem reasonable to suggest that they are representative of opinions of some of the largest professional investment institutions and that they may not be wholly unrepresentative of more general expectations. Since investors consult professional investment institutions in forming their own expectations, individuals' expectations may be strongly influenced—and so reflect—those of their advisers.[6] Also, insofar as investors follow the same sorts of procedures as those used by security analysts in forming expectations, the investors' expectations would resemble those of the analysts. It should be noted, however, that security analysts are not limited to published data in forming their expectations. They frequently visit the companies they study and discuss the corporations' prospects with their executives.

Each growth-rate figure was reported as an average annual rate of growth expected to occur in the next five years. At first thought, such a rate of growth depends on what earnings are expected to be in five years' time and on the base-year earnings figures. However, this dependence need not be very great if the growth rate is regarded more as a parameter of the process determining earnings than as an arithmetic quantity linking the current value to the expected future value. Discussion with the suppliers of the data indicated that all firms were attempting to predict the same future figure, the long-run average ("normalized") earnings level, abstracting from cyclical or special circumstances. The bases used were less clear. Some firms explicitly used their estimates of "normalized" earnings during the year in which the prediction was made. Others provided different figures as bases: in one case the firm estimated actual earnings, in another a prediction of earnings four years in the future was furnished. These differences did not seem to be reflected in the growth rates, however, since attempts to adjust the rates for differences in

5. We are deeply grateful to the participating firms, who wish to remain anonymous. Not all volunteers were able to supply data useful to this study, either because the actual supply of data would have been too burdensome (being kept for internal records in a form that made their extraction difficult) or because the data supplied were not comparable to data used here (either being of a short-term nature or being made at different dates). Because one of our main objectives is to examine differences and similarities in predictions of the same quantities, such data were not used in the present paper.

6. That several of our participating firms find it worthwhile to publish these projections and provide them to their customers provides *prima facie* evidence that a certain segment of the market places some reliance on such information in forming its own expectations.

base figures introduced rather than removed disparities among the predictions.

The growth rates were given as single numbers for each corporation. No indication was provided of the confidence with which these point estimates were held. One firm did provide an instability index of earnings which represented a measure of the past variability of earnings (around trend) adjusted by the security analyst to indicate potential future variability. Moreover, two firms provided quality ratings, which classified companies into three or four quality categories.

Two of the firms provided estimates of past growth rates as well as predictions. The figures represented perceived growth over the past 8-10 years, the past 4-5 years, the past 6 years, and the last year. It may seem unnecessary to rely on the participating firms for estimates of historic growth rates. However, the past growth of a company's earnings is not, in any meaningful sense, a well-defined concept. Earnings—being basically a small difference between two large quantities—can exhibit large year-to-year fluctuations. They also can be negative, which creates problems for most mechanical calculations. In addition, the accounting definition of earnings is not an exact conformity with the economically relevant concept of profits or return on investors' capital. For these reasons, calculated growth rates are sensitive to the particular method employed and the period chosen for the calculation. Consequently, such calculations may be a poor reflection of what growth is generally considered to have been, and may not be useful in assessing the past performance of corporations. Furthermore, it may be supposed that in assessing security analysts' predictions of growth their own estimates of past growth are more likely to be relevant than objectively calculated rates. The extent of agreement among the two types of measures is among the subjects considered in the next section.

Our participating firms also supplied an industrial classification. While other classifications are available, the concept of industry is not really precise enough to get a fixed, unquestionable assignment of corporations to industries. Particular problems are presented by conglomerate companies. Perceived industry may be more relevant than any other grouping when investigating anticipations. The classification we use represents a consensus about industry among our participants. Where disagreements occurred (as was often the case with conglomerates), the corporation was simply classified as "miscellaneous." The classification represented considerable aggregation over finer classifications and only eight industries were distinguished. These were:

1) Electricals and Electronics
2) Electric Utilities
3) Metals
4) Oils
5) Drugs and Specialty Chemicals
6) Foods and Stores
7) "Cyclical"—including companies such as automobile and aircraft manufacturers, and meat packers
8) "Miscellaneous"

II. Agreement among Predictors

The agreement among the growth-rate projections is described and summarized in this section. In the course of this description, the extent of agreement about base-earnings figures and the closeness of the projections to past, perceived, and calculated growth rates are also considered.

A. *Comparisons of Predictions of Future Growth Rates.*

The extent of agreement among the predictors about future growth rates is summarized in Table 1. Of the five predictors, the correlations among predictors A, B, C and E were all roughly of the same orders of magnitude.[7] Predictor D showed some tendency towards lower agreement. (Predictor D also had the highest average growth forecast and standard deviation for the companies for which it and others made forecasts.) Over-all agreement among

TABLE 1
Agreement Among Growth-Rate Predictions*

I. Correlation Coefficients
(Simple correlations in lower left portion, Spearman rank correlations in upper right portion)

1962	A	B	C	D	1963	A	B	C	D	E
A	1.000	.768	.751	.388	A	1.000	.795	.717	.374	.709
B	.840	1.000	.728	.597	B	.832	1.000	.760	.518	.821
C	.889	.819	1.000	.690	C	.854	.764	1.000	.750	.746
D	.563	.621	.848	1.000	D	.537	.567	.898	1.000	.450
					E	.827	.835	.889	.704	1.000

II. Kendall's Coefficient of Concordance for Ranks of Companies by Different Predictors

Predictors	(A,B,C)	(A,B,D)	(A,B,C,D)	(A,B,C,D,E)
1962	.82	.73	.78	
1963	.83	.71	.81	.79

III. Proportions of Total Variance Due to Variance in Average Predictions

Predictors	(A,B,C)	(A,B,D)	(A,B,C,D)	(A,B,C,D,E)
1962	.87	.70	.79	
1963	.85	.68	.83	.87

* The numbers of observations on which this table and other tables are based varies between cells. For the correlations, the numbers of observations are reported below:

1962	A	B	C	1963	A	B	C	D
B	185			B	185			
C	60	60		C	62	62		
D	178	178	58	D	182	182	61	
				E	125	125	39	124

For other comparisons, the number of observations is the minimum of the numbers of observations used to compute the correlations.

7. The analysis is presented mainly for the raw growth figures, but very similar impressions would be obtained from examining their logarithms.

the predictors is further summarized in the second and third parts of Table 1, which show the values of Kendall's coefficient of concordance and the proportion of total variance of the predictions that can be accounted for by differences in the mean prediction among companies.[8] It may be remarked that the entries in Table 1 are based on different numbers of observations. In each case, we used the maximum number of observations (companies) for which a comparison could be made. The impressions to be gained from Table 1 would be little changed, however, by basing all calculations only on the set for which all predictors provided data.

Though Table 1 suggests considerable agreement, the lack of agreement it also reveals can hardly be considered negligible. In addition to the lack of correlation, there were also some systematic differences among the predictors. For the matched set of observations the means and the standard deviations were of roughly the same sizes. However, the differences among the central tendencies were significant according to both parametric and nonparametric tests.

B. *Analysis of Predictions Within Industrial Classifications.*

One might suspect that the correlations among the predictors reflect little more than consensus about the industries that are expected to grow most rapidly rather than agreement about the relative rates of growth of firms within industries. This possibility was investigated by decomposing the correlation coefficients into two parts, one due to correlation within industries (r_w) and one due to correlation among the industry means (r_a).

$$r = r_w + r_a$$

where

$$r_w = \frac{\sum_{j=1}^{J}\sum_{i=1}^{N_j}(x_{ij}-\bar{x}_j)(y_{ij}-\bar{y}_j)}{\sqrt{\sum_{j=1}^{J}\sum_{i=1}^{N_j}(x_{ij}-\bar{x})^2\sum_{j=1}^{J}\sum_{i=1}^{N_j}(y_{ij}-\bar{y})^2}},$$

and

$$r_a = \frac{\sum_{j=1}^{J}N_j(\bar{x}_j-\bar{x})(\bar{y}_j-\bar{y})}{\sqrt{\sum_{j=1}^{J}\sum_{i=1}^{N_j}(x_{ij}-\bar{x})^2\sum_{j=1}^{J}\sum_{i=1}^{N_j}(y_{ij}-\bar{y})^2}}$$

with

8. The values shown in all parts of Table 1 are significant well beyond the conventionally used levels of significance. We may note that Tukey's test for interaction in a two-way analysis of variance [11, pp. 129-37]—the typical model in which the breakdown of variance used in Part 3 of Table 1 is employed—indicated a small but highly "significant" proportion of variance attributable to interaction. However, the usual analysis-of-variance model does not seem appropriate for this data, not only because of interactions, but also because of possible lack of homogeneity of variance.

x_{ij}, y_{ij} being the i^{th} observations in the j^{th} class (industry),
N_j being the number of observations in the j^{th} class,
J being the number of classes,
$\bar{x}_j$, $\bar{y}_j$ being the averages within the classes, and
$\bar{x}$, $\bar{y}$ being the over-all averages.

This decomposition indicated that agreement concerning industry growth rates is not the major factor accounting for the correlations among the forecasts. The first part of Table 2 shows the values of r_a using the industrial classification obtained from the participating firms. As comparison with Table 1 shows, only a small part of the correlations among the predictions are due to correlations among the industry means. Further light can be shed on this question by calculating the partial correlations between the predictions, holding industry classification constant. The second panel of Table 2 reveals

TABLE 2
INDUSTRIAL CLASSIFICATION AND AGREEMENT AMONG PREDICTORS

I. Values of r_a

	1962 A	1962 B	1962 C		1963 A	1963 B	1963 C	1963 D
B	.299			B	.305			
C	.285	.323		C	.230	.315		
D	.090	.184	.300	D	.057	.137	.317	
				E	.266	.348	.366	.194

II. Partial Correlations Holding Industrial Classification Constant

	1962 A	1962 B	1962 C		1963 A	1963 B	1963 C	1963 D
B	.799			B	.786			
C	.861	.760		C	.838	.690		
D	.656	.665	.887	D	.657	.650	.861	
				E	.828	.790	.897	.777

that these partial correlations tended to be only slightly less than the simple correlations and, in the case of Predictor D, the partial correlations were actually higher.

It is also interesting to examine the extent to which the correlations among predictors' forecasts varied over the different industry groups. This should indicate whether certain industry groups are more difficult to forecast in an *ex ante* sense. The correlations among forecasters tended to be lowest in the oil and cyclical industry groups, and highest for electric utility companies. These differences were significant for all pairs of predictions considered. Ranking the correlations over industries, and then comparing these ranks among pairs of predictors, showed substantial concordance over the ordering of the correlations.[9]

9. The test for individual pairs of predictions was the likelihood-ratio test. Note that the ranking comparison is not based on independent observations so a statistical test of the concordance is not appropriate. This suggests that the "significance" of the over-all correlations mentioned earlier should really be treated only as descriptive indications of their sizes. The hypothesis that

C. *Comparisons of Predictions and Past Growth Rates.*

The extent of agreement among the predictors can usefully be evaluated by comparisons of the predicted growth rates with earlier predictions and with the past growth rates of earnings. The correlations of the 1963 predictions with the 1962 ones were: .94, .95, .96, and .88 for predictors A through D respectively. All of these are considerably higher than the correlations of the predictions with each other. On the other hand, changes in expected growth rates were not highly correlated among predictors.[10]

TABLE 3
PREDICTIONS AND PAST GROWTH RATES*
(CORRELATIONS OF PREDICTED WITH PAST GROWTH RATES)

	1962				1963				
	A	B	C	D	A	B	C	D	E
g_{p1}	.78	.68	.75	.41	.85	.73	.84	.56	.67
g_{p2}	.75	.67	.72	.51	.79	.69	.80	.58	.76
g_{p3}	.77	.71	.82	.61	.75	.72	.79	.70	.74
g_{p4}	.34	.37	.59	.44	.33	.45	.70	.75	.58
g_{c1}	.55	.46	.65	.32	.63	.52	.61	.30	.58
g_{c2}	.67	.60	.68	.18	.72	.58	.73	.20	.56
g_{c3}	.75	.63	.73	.17	.79	.66	.76	.17	.57
g_{c4}	.82	.68	.79	.24	.83	.69	.79	.29	.60

* g_{p1} is 8-10 year historic growth rate supplied by A
g_{p2} is 4-5 year historic growth rate supplied by A
g_{p3} is 6 year historic growth rate supplied by D
g_{p4} is preceding 1 year growth rate supplied by D
g_{c1} is log-regression trend fitted to last 4 years
g_{c2} is log-regression trend fitted to last 6 years
g_{c3} is log-regression trend fitted to last 8 years
g_{c4} is log-regression trend fitted to last 10 years.

Correlations of the predictions with eight past growth figures are shown in Table 3. Four of these past growth rates were supplied by the participating firms and represent the firms' perceptions of the growth of earnings per share that had occurred in different preceding periods. The others were calculated as the coefficient in the regression of the logarithms of earnings per share on time over the past 4, 6, 8, and 10 years. These correlations generally are not much lower than those found in comparing the predictions with each other. Among the perceived past growth rates, the correlations are apt to be lowest with the growth rates over the most recent year. With the calculated growth rates, there

the correlations are all zero within industries could, however, be rejected well beyond conventional significance levels. Predictor C was dropped from these tests due to paucity of data in many industries.

10. These correlations, for the participants supplying data in both years were:

	A	B	C
B	.19		
C	.04	.04	
D	.07	.11	.29

Only the two largest of these correlations would be significant at the .05 level.

was a tendency for the correlations to increase with the length of period over which the calculations were made.[11]

These comparisons of past with predicted growth rates suggest that the apparent agreement among the predictors may reflect little more than use by all of them of the historic figures. In investigating this possibility, the partial correlations among the predictions, holding constant past perceived growth rates, holding constant past calculated growth rates, and holding both sets constant were calculated. The first two sets of partial correlations were not much smaller than the simple correlations. Holding both sets constant produced the partial correlations shown in Table 4. These are considerably

TABLE 4
PARTIAL CORRELATIONS OF PREDICTIONS
HOLDING PAST GROWTH RATES CONSTANT

	1962				1963			
	A	B	C		A	B	C	D
B	.49			B	.49			
C	.49	.18		C	.25	.03		
D	.35	.39	.22	D	.56	.46	.40	
				E	.56	.62	—.11	.51

NUMBERS OF OBSERVATIONS

	1962				1963			
	A	B	C		A	B	C	D
B	111			B	112			
C	49	49		C	50	50		
D	111	111	49	D	112	112	50	
				E	78	78	36	78

smaller than the simple correlations, though all but the four smallest entries would be significant beyond the .05 level. Thus, while a substantial part of the agreement among predictors appears to result from their use of historic growth figures, there is also evidence that security analysts tend to make similar adjustments to the past growth rates.[12]

Examination of the correlations among past growth rates help both to evaluate the correlations among the predictions and to indicate the sensitivity of measurements of growth rates to the methods by which they were calculated. Table 5 presents correlations between 13 such past growth rates for our 1962 data. The correlations between the different measures of past growth are fairly low. When exactly the same data are used in the calculations, however, the

11. This effect was also found when the calculated growth rates were based on either 1) the regression of earnings per share on time; or, 2) the appropriate root of the ratio of earnings per share at the end of the period to earnings at the beginning.

12. The numbers of observations on which Table 4 is based are considerably smaller than those for which predictions were available. Only a small part of this loss was due to inability to calculate past growth rates due to negative earnings figures. Much more important was the fact that the predictors did not give numerical figures for past growth rates when these would be negative. One might think that the companies for which past growth rates were easily calculated would be ones with highest simple correlations among the predictors. However, the only cases for which this appeared to be true were the correlations of predictor D with A, B, and E.

correlations among the growth rates calculated by different methods are relatively high, though probably not so high that the choice of method of calculation would be a matter of no importance. Finally, the perceived growth rates furnished by the security firms tend to be more highly correlated with the growth rates calculated over longer periods. The increase in correlation coefficients did not continue, however, when calculations over more than ten years were made and, as shown in Table 5, it stopped before ten years in some cases. Correlations for other periods and for the 1963 data were of about the same magnitude as those in Table 5.

TABLE 5
PAST GROWTH CORRELATIONS, 1962*

	g_{p1}	g_{p2}	g_{p3}	g_{p4}	g_{c1}	g_{c2}	g_{c3}	g_{c4}	g_{c5}	g_{c6}	g_{c7}	g_{c8}
g_{p2}	.70											
g_{p3}	.82	.87										
g_{p4}	.49	.39	.37									
g_{c1}	.34	.47	.48	.15								
g_{c2}	.68	.74	.76	.05	.62							
g_{c3}	.81	.89	.97	.15	.49	.90						
g_{c4}	.93	.80	.87	.27	.41	.75	.93					
g_{c5}	.14	.19	.25	.39	.38	.24	.16	.15				
g_{c6}	.34	.46	.47	.14	.96	.59	.45	.37	.53			
g_{c7}	.92	.67	.78	.32	.48	.67	.83	.95	.33	.46		
g_{c8}	.36	.56	.49	.23	.99	.63	.50	.43	.40	.90	.51	
g_{c9}	.87	.75	.88	.18	.46	.77	.93	.99	.17	.40	.91	.43

* $g_{p1} - g_{p4}$, $g_{c1} - g_{c4}$ as defined in footnote to Table 3
g_{c5} is 1 year growth rate calculated from first differences of logarithm
g_{c6} is 4 year growth rate calculated from average of first differences of logs
g_{c7} is 10 year growth rate calculated from average of first differences of logs
g_{c8} is 4 year growth rate calculated from regression of earnings on time
g_{c9} is 10 year growth rate calculated from regression of earnings on time

D. *Comparisons of Predictions with Price-Earnings Ratios.*

Finally, we may examine the extent of agreement among predictors by comparing their forecasts with the price-earnings ratios of the corresponding securities. By utilizing a normative valuation model (see e.g., [4] or [8]) it is possible to calculate an implicit growth rate from the market-determined earnings multiple of a security. Thus, comparisons of the predictions with price-earnings ratios may be interpreted as examinations of the relationship between the forecasts and market-expected growth rates. Correlations with two versions of the price-earnings ratio are shown in Table 6. The prices used were the closing prices for the last day of the year. The earnings were either the actual earnings or the average of the base-earnings figures supplied by A and B for their growth rates. These latter figures represent "normalized" or trend-earnings figures. Specifically, they represent an attempt to estimate what earnings would be in the absence of cyclical or special factors. The correlation coefficients in the table are about the same as those obtained when the forecasts were compared with each other. Since price-earnings ratios are

TABLE 6
CORRELATIONS OF PREDICTIONS WITH PRICE-EARNINGS RATIOS*

	A	B	C	D	E
1962					
P/E	.76	.80	.86	.56	
P/NE	.82	.83	.83	.55	
1963					
P/E	.77	.74	.86	.67	.85
P/NE	.81	.76	.80	.60	.85

* P/E is the price/earnings ratio. P/NE is price/average of base (normalized) earnings of A and B.

affected by several variables other than expected growth rates, this exercise underscores the extent of disagreement among the forecasters.

III. ACCURACY OF PREDICTIONS

In assessing the forecasting abilities of the predictors, we encountered one major difficulty. The five years in the future for which the forecasts were made have not yet elapsed. As a result, we were forced to compare the forecasts with the realized growth of actual and normalized earnings (as estimated by Predictors A and B) through 1965. Since the latter figures represent what earnings are thought to be on their long-run growth path, perhaps not too much violence is done to the intentions of the forecasters by making these a standard of comparison.

A. *Method of Evaluation.*

The forecasts were evaluated by the use of simple correlations and by the inequality coefficient,[13]

$$U^2 = \frac{\Sigma(P_i - R_i)^2}{\Sigma R_i^2}, \quad (1)$$

where P_i is the predicted and R_i the realized growth rates for the i^{th} company. It will be noticed that the inequality coefficient, in effect, gives a comparison between perfect prediction ($U^2 = 0$) and a naive prediction of zero growth for all corporations ($U^2 = 1$).

We also investigated the extent to which errors in predictions were related to 1) errors in predicting the average over-all earnings growth of the sample firms; 2) errors in predicting the average growth rate of particular industries; and 3) errors in predicting the growth rates of firms within industries. To accomplish this, we decomposed the numerator of (1) into three parts. The first comes from the average prediction for all companies not being equal to the average realization. The second part arises from differences among the

13. Note that this is similar to the inequality coefficient introduced by Theil [14].

average industry predictions not being equal to the corresponding differences in industry realizations. The third arises from the differences in predictions for the corporations within an industry not being the same as the differences in realization.[14] The proportions of U^2 arising from these three sources will be called U^M, U^{BI}, and U^{WI} respectively for mean errors, between-industry errors, and within-industry errors.

B. *Over-all Accuracy of the Forecasts.*

Statistics summarizing the forecasting abilities of the predictors and the success of using perceived past growth rates to predict the future are presented in Table 7. By and large, the correlations of predicted and realized growth rates are low, though most of them are significantly greater than zero, and the inequality coefficients are large. The major exception to this is Predictor C's forecasts. However, this apparent superiority is largely illusory since C tended to concentrate on large, relatively stable companies and, we suspect, predictions were made only when there was *a priori* reason to believe that the forecasts would be reliable. That this conjecture has some validity is borne out by the fact that the set of companies for which C made forecasts had a lower average instability index than did our whole sample. Moreover, all the other forecasts, including the perceived past growth rates, did better for this set of companies than for the larger set.[15]

Several additional points about the over-all accuracy of the forecasts are worth mentioning. First, the forecasts based on perceived past growth rates, including even growth over the most recent year, do not perform much differently from the predictions. There seems to be no clear-cut forecasting advantage to the careful and involved procedures our predictors employed over their perceptions of past growth rates either in terms of correlation or of the inequality coefficient.

Second, all predictors had a better record than the no-growth forecast for each company. However, it is possible to find a single growth rate that would yield lower mean square errors than any of the predictions. This is a result of the average realized growth rates being considerably higher than the average

14. Letting P_{kj} and R_{kj} be the predicted and realized growth rates for the k^{th} company ($k = 1, \ldots, N_j$) in the j^{th} industry ($j = 1, \ldots, J$), we can write the numerator of (1) as:

$$\sum_{j=1}^{J}\sum_{k=1}^{N_j}(P_{kj}-R_{kj})^2 = \left[\sum_{j=1}^{J} N_j(\bar{P}-\bar{R})^2\right] + \left[\sum_{j=1}^{J} N_j\{(\bar{P}_j-\bar{P})-(\bar{R}_j-\bar{R})\}^2\right] + \left[\sum_{j=1}^{J}\sum_{i=1}^{N_j}\{(P_{kj}-\bar{P}_j)-(R_{kj}-\bar{R}_j)\}^2\right],$$

when $\bar{P}_j$, $\bar{R}_j$ are the averages for the j^{th} industry and $\bar{P}$ and $\bar{R}$ are the overall means. The three terms in square brackets are the ones referred to in the text.

15. For this smaller group of companies, the differences among predictors was far less than is suggested by Table 7. It is worth noting that C had a higher correlation and lower inequality index than the others in 1962 (with D a very close second), but both D and E were slightly better on the matched set in 1963.

TABLE 7
ACCURACY OF PREDICTIONS

Predictor	A	B	C	D	E	g_{p1}	g_{p2}	g_{p3}	g_{p4}
I. 1962 Predictions Compared with Growth of Actual Earnings 1962-1965									
Correlation	.07	.16	.66	.45		.22	—.01	.23	.16
U	.80	.78	.57	.67		.74	.88	.74	.78
U^M	.31	.32	.20	.24		.17	.12	.10	.20
U^{BI}	.11	.10	.08	.06		.11	.04	.04	.12
U^{WI}	.58	.58	.71	.70		.73	.84	.75	.68
Number of Observations	185	185	60	178		168	140	140	145
II. 1962 Predictions Compared with Growth of Normalized Earnings 1962-1965									
Correlation	.26	.32	.68	.45		.23	.16	.38	.09
U	.74	.72	.57	.62		.72	.80	.67	.76
U^M	.25	.25	.08	.13		.09	.12	.09	.19
U^{BI}	.07	.06	.06	.08		.08	.07	.05	.08
U^{WI}	.68	.69	.86	.79		.83	.80	.86	.73
Number of Observations	180	180	59	175		164	136	138	142
III. 1963 Predictions Compared with Growth of Actual Earnings 1963-1965									
Predictor	A	B	C	D	E	g_{p1}	g_{p2}	g_{p3}	g_{p4}
Correlation	.05	.16	.78	.47	.29	.20	.31	.22	.55
U	.85	.84	.59	.73	.81	.78	.75	.77	.62
U^M	.33	.34	.27	.28	.40	.20	.19	.16	.27
U^{BI}	.12	.11	.11	.07	.11	.09	.06	.06	.05
U^{WI}	.54	.55	.62	.66	.49	.70	.74	.79	.69
Number of Observations	185	185	62	182	125	167	143	138	169
IV. 1963 Predictions Compared with Growth of Normalized Earnings 1963-1965									
Correlation	.27	.29	.70	.34	.49	.36	.52	.41	.32
U	.78	.78	.61	.70	.74	.69	.64	.67	.69
U^M	.35	.35	.22	.23	.40	.22	.33	.23	.12
U^{BI}	.07	.06	.08	.09	.09	.08	.09	.05	.06
U^{WI}	.58	.59	.70	.68	.50	.70	.57	.72	.82
Number of Observations	180	180	61	177	123	163	139	136	165

expectation of each predictor. This may simply indicate a failure to anticipate the continuation of the expansion through the period considered, but it may also reflect the underestimation of change frequently found in investigating forecasts.[16]

Third, with the exception of the past growth rate in the year immediately preceding the forecast date, all predicted and perceived past growth rates were better at predicting the average normalized growth rates than the actual ones. However, whether this is because normalized earnings gave a better picture

16. See, for example, Zarnowitz [16]. Since almost all the actual growth rates were positive, we do not know whether underestimation of change would also characterize predictions when earnings were generally declining. No forecasters predicted a negative rate of growth.

of the true growth of corporations or because normalized earnings calculations are influenced by past growth-rate forecasts is open to question.

C. *Analysis of the Forecasts by Industrial Categories.*

Turning to the industry breakdown of the forecasts, we find that failure to forecast industry means (U^{BI}) accounted for only a very small proportion of the inequality coefficient. The main sources of inequality were the within-industry errors.

Looking at the correlations of predictions with future growth rates within industries permits us to assess which industries were most difficult to forecast in an *ex post* sense. The extent to which forecasters found the various indus-

TABLE 8
RANK SCORES OF CORRELATIONS OF PREDICTIONS AND REALIZATIONS SUMMED OVER PREDICTORS*

	1962-65 Growth of Actual Earnings	1962-65 Growth of Normalized Earnings	1963-65 Growth of Actual Earnings	1963-65 Growth of Normalized Earnings	Total
Industry					
1)	20	23	20	28	91
2)	18	22	14	25	79
3)	9	11	24	14	58
4)	10	10	8	7	35
5)	5	7	24	26	62
6)	8	5	5	10	28
7)	14	15	20	20	69
8)	24	15	29	14	82
Kendall's W	.76	.74	.72	.65	.32

* Entries are sums of ranks over predictors for correlations of predictions with growth rates indicated in column headings.

tries difficult to predict is indicated in Table 8. To calculate the table, we first ranked each predictor's correlation coefficients between his forecasts and realizations over the eight industry groups. The industry for which the predictor had the most difficulty (worst correlation) was given a rank of one. In Table 8, we present the sums of the ranks for each industry over the four predictors.[17] If the difficulty ranking for all predictors was identical, the rank totals would be 4 for the most difficult industry (in 1963 when there are four predictors compared), 8 for the next most difficult, etc., and the coefficient of concordance (Kendall's W) would be unity. For each of the sets presented, the values of Kendall's W are significant (beyond the .05 level) as were the differences between industries for the correlation coefficients for each predictor.[18] Correlation coefficients between forecasts and realizations tended to

17. Predictor C could not be included in this calculation because of a lack of observations in some industries.

18. The latter, however, was tested only on the basis of the asymptotic distribution of the correlation coefficient and the assumption that the data were distributed normally.

be highest in industries (1) electricals and electronics, (8) "miscellaneous," and (2) electric utilities; they were lowest in (6) foods and stores and (4) oils. Industry (5) drugs, showed very low correlations for the 1962 predictions and high ones for the 1963 predictions. Similar patterns emerged, though more weakly, when perceptions of past growth rates over more than one year were used as forecasts. It is interesting to note that certain industries which were "difficult to forecast" in an *ex ante* sense (see Section II. B) actually turned out to be difficult to predict, *ex post*. For example, there was high (low) agreement among predictors concerning the growth rates for the electric utilities (oils) and also high (low) correlation between predictions and realizations.

In general, we had little success in associating forecasting success with any industry or company characteristics. The differences between industries in forecasting success were only moderately related either to the average growth rates to be realized or to the variances of the realized growth rates. Two of the industries where the highest correlations were found, industries (1) and (2), had respectively the highest and the lowest average growth rates and variances. The third industry where success occurred, (8), fell in the middle range for both quantities. The rank-totals of the last column of Table 8 had a rank correlation with the rank-totals for average growth rates of .14 and of .37 with the rank-totals for the variances.

To further investigate how forecasting ability was related to company characteristics, the corporations were classified according to the quality ratings supplied by two of the predicting firms. There was a tendency for the correlations to be lowest (and negative) in the poorest-quality grouping, but they did not get systematically higher with quality, the highest correlations tending to occur in the middle classes. Similarly, classifying by high, low, or medium values of the instability index showed no pronounced differences in performance. The forecasting performances were again worst for the lowest-quality corporations and best in the middle category. When the corporations were classified by high, medium, or low price-earnings multiple, or past growth rate of earnings, or future growth rates of earnings, sales or assets, no pronounced or significant patterns emerged.

IV. An Appraisal of the Forecasts

The rather poor over-all forecasting performances of the predictors and the fact that their past perceptions of growth rates were about as reliable forecasts as their explicit predictions raises two questions: 1) Does any naive forecasting device based on historic data yield as good forecasts as the painstaking efforts of security analysts? 2) Is it the basically volatile nature of earnings that explains our results and would the predictions appear more accurate if they were taken to be forecasts of more stable measures of the growth of corporations?

To investigate the first of these questions, past growth rates calculated on the basis of arithmetic and logarithmic regressions and on the geometric means of first ratios, calculated over periods up to 14 years, were compared with

TABLE 9
CORRELATIONS OF CALCULATED PAST GROWTH RATES ON REALIZATIONS*

	Growth of Actual Earnings 1962-65	Growth of Normalized Earnings 1962-65	Growth of Actual Earnings 1963-65	Growth of Normalized Earnings 1963-65
I. Correlations				
g_{c1}	.03	.42	.01	.26
g_{c2}	−.15	.19	−.15	.06
g_{c3}	−.13	.15	−.16	.02
g_{c4}	−.10	.09	−.11	−.02
g_{c5}	.22	.62	.18	.46
g_{c6}	.12	.51	.06	.34
g_{c7}	.01	.24	−.01	.12
g_{c8}	−.02	.37	−.03	.23
g_{c9}	−.12	.09	−.14	−.01
II. Inequality Coefficients				
g_{1c}	.93	.79	.93	.85
g_{c2}	1.03	.95	1.01	.96
g_{c3}	.95	.88	.96	.91
g_{c4}	.88	.82	.90	.86
g_{c5}	1.27	1.22	1.11	1.08
g_{c6}	.89	.73	.90	.80
g_{c7}	.83	.75	.86	.80
g_{c8}	.98	.85	.96	.87
g_{c9}	.89	.83	.91	.86

* For definition of g's see footnote to Table 5.

the realized growth rates through 1965. A selection of these comparisons based on data ending in 1962 is found in Table 9.[19]

It is interesting to note first that the calculated growth rates tend to be more closely correlated with the growth rates of normalized earnings than with the growth rates of actual earnings. This is an even more pronounced feature of the calculated growth rates than of the data considered earlier. Second, while the correlations of the calculated growth rates with the realized growth rates tended to be lower than those found for the predictions and perceptions, and fewer of them differed significantly from zero, these differences are not pronounced. However, unlike the earlier data, the calculations seem to have almost no forecasting ability, a finding similar to that of I. M. D. Little [7] for British corporations. Among the calculated rates, those for shorter periods of time tend to be somewhat better in terms of correlation than those for longer ones, a feature highlighted by the strong showing of the growth rates calculated over only one year (g_{c5}). Third, while one would have expected that extrapolations using as the last year for the calculation the same year that is used for the first year in calculation of the realization would have a lower correlation than extrapolations where the data ended a year earlier, in

19. The figures there are typical both of what was found when other periods were used and of the comparisons of calculations ending in 1961 and 1963 with the perceived growth after 1962 and 1963 respectively.

fact the reverse tendency manifested itself. Finally, among the possible ways of calculating growth rates, those based on the geometric means of the first ratios surpassed those based on regressions.

The superiority of the past perceived growth rates over the calculated ones should not be taken too seriously, however, for it was largely due to the fact that negative perceived growth rates were not reported by our participants. The survey respondents only indicated that the rates were negative. As a result, companies for which this was true had to be dropped from the sample when correlations of realized with perceived past growth rates were made. When we dropped the companies whose past calculated growth rates were negative (in order to put the calculated and perceived growth rates on a similar basis), the correlation coefficients of the calculated with the realized growth rates were raised. For example, with this change the first row of Table 9 would read

.30 .53 .17 .42

which compares favorably with the data in Table 7. Similar improvements occurred using the other types of calculated growth rates.

The possibilities of obtaining useful forecasts from simple extrapolation were also examined by calculating growth rates over the four preceding years[20] for (1) earnings plus depreciation, (2) earnings before taxes, (3) sales, (4) assets, and (5) share prices. The correlations of these growth rates calculated to the end of 1962, both with 1962-1965 and 1963-1965 earnings growth and the growth rates of the same variables, are shown in the first five rows of Table 10. It will be noticed that both the levels and the variation of these correlation coefficients are quite similar to those found for the predictions and perceptions of past growth and the equivalently calculated past growth rates of earnings. There was also no marked tendency for the extrapolations to do better at predicting their own growth rates than the growth rates of normalized earnings, but they tended to be better at predicting their own rates than the growth of actual earnings.

The last two rows of Table 10 show the correlations of the price-earnings ratio and the price-to-normalized-earnings ratio with the actual future growth of earnings. As mentioned earlier, these ratios have implicit in them a forecast of the rate of growth anticipated by the market. We find that, in terms of correlation, the market-determined earnings multiples perform no differently from the other predictors we have considered.

A similar picture emerged when the predictions and perceptions of growth rates of earnings were used to predict the growth that would occur in these same variables through the end of 1965. With the exception of the growth of price, the performance of the predictions and perceptions were about the same in terms of correlation as those shown when they were used to forecast the growth of normalized earnings. The inequality coefficients were, if anything, slightly lower. For price growth, however, these forecasts had virtually

20. Other periods and methods of calculating growth rates were also used. The ones presented tended to be very slightly better than the others and are comparable to the most successful of the longer-term earnings extrapolations.

TABLE 10
EXTRAPOLATIONS FROM OTHER SERIES AS PREDICTORS OF EARNINGS AND OWN GROWTH RATES*
(CORRELATION COEFFICIENTS)

	Growth of Actual Earnings 1962-65	Growth of Normalized Earnings 1962-65	Growth of Actual Earnings 1963-65	Growth of Normalized Earnings 1963-65	Growth Rate of Corresponding Variable 1962-65	Growth Rate of Corresponding Variable 1963-65
g_{e1}	.11	.39	.05	.27	.28	.20
g_{e2}	.29	.21	.42	.30	.24	.38
g_{e3}	.23	.37	.15	.29	.39	.31
g_{e4}	.29	.46	.47	.60	.63	.27
g_{e5}	.04	.34	−.03	.20	−.06	.05
P/E	.21	.25	.13	.18	—	—
P/NE	.14	.35	.08	.21	—	—

* g_{e1} is growth of earnings plus depreciation
g_{e2} is growth of earnings plus taxes
g_{e3} is growth of sales
g_{e4} is growth of assets
g_{e5} is growth of price of stock
P/E is price-earnings ratio at end of 1962
P/NE is price-normalized earnings ratio at end of 1962
The period used for the calculations of the growth rates was 1958-62 and the rates were calculated as

$$g = \sqrt[4]{V_{62} / V_{58}}$$ where V_{62} and V_{58} are the values of the variables.

no merit, with even poorer performance than they had for the growth of actual earnings.

V. CONCLUSION

In this paper, we have examined the characteristics of a small sample of security analysts' predictions of the long-run earnings growth of corporations. The extent of agreement among the different predictors was considered and their forecasting abilities assessed. Evidence has recently accumulated [7] that earnings growth in past periods is not a useful predictor of future earnings growth. The remarkable conclusion of the present study is that the careful estimates of the security analysts participating in our survey, the bases of which are not limited to public information, perform little better than these past growth rates. Moreover, the market price-earnings ratios themselves were not better than either the analysts' forecasts or the past growth rates in forecasting future earnings growth.

We must be cautious, however, in overgeneralizing these results. We did not have data to investigate directly whether the performance of the predictions of growth in the period considered were atypical of the usual forecasting abilities of such forecasts. The question is important, however, since it can be argued that the peculiarities of the expansion that occurred after the date of the forecasts made the period especially difficult to forecast. Moreover, our work is hampered by the fact that only a few firms were able to participate in our survey. It may also be that shorter-term earnings predictions are considerably more successful relative to naive forecasting methods. Fortunately, we are presently collecting additional data that will help shed light on these conjectures and permit a study of the generation of earnings forecasts and their usefulness in security evaluation.

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EXPECTATIONS AND SHARE PRICES*

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It is generally believed that security prices are determined by expectations concerning firm and economic variables. Despite this belief there is very little research examining expectational data. In this paper we examine how expectations concerning earning per share effect share price. We first show that knowledge concerning analyst's forecasts of earnings per share cannot by itself lead to excess returns. Any information contained in the consensus estimate of earnings per share is already included in share price. Investors or managers who buy high growth stocks where high growth is determined by consensus beliefs should not earn an excess return. This is not due to earnings having no effect upon share price since knowledge of actual earnings leads to excess return. Much larger excess returns are earned if one is able to determine those stocks for which analysts most underestimate return. Finally, the largest returns can be earned by knowing which stocks for which analysts will make the greatest revision in their estimates. This pattern of results suggests that share price is affected by expectations about earnings per share. Given any degree of forecasting ability managers can obtain best results by acting on the differences between their forecasts and concensus forecasts.
(FINANCE; FINANCE—INVESTMENT)

1. Introduction

A central theme of modern investment theory is that expectations about firm characteristics are incorporated into security prices. This theme can be found in most investment texts and is utilized in much of the current research in finance. Not only does this belief pervade academia it is commonly held by the financial community.

Surprisingly, in light of the strength of this belief, there is very little empirical evidence to support it. Almost all research which attempts to measure the impact of expectations utilizes not expectational data but historical extrapolations of past data that the authors hope will serve as a proxy for expectational data. This is true for most tests of valuation models as well as almost all tests in the efficient markets literature.

The purpose of this article is to examine the importance of expectations concerning one variable, earnings per share, in the determination of share price. Earnings per share is considered a key variable in determining share price and has been studied extensively in the efficient markets literature. In almost all studies, expectations of future earnings per share are formulated as an extrapolation of past earnings.[1] Justification for using historical extrapolation is sometimes found in tests of the accuracy of extrapolated data in forecasting future earnings.

While tests such as those found in [3], [4], and [5] provide some evidence of the relative accuracy of historical extrapolation versus expectational data as forecasts of the future, they do not address the question of the role of expectations in share price formation. The purpose of this paper is to directly address this question. More

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[1] Malkiel and Cragg [8] used expectational data on earnings growth in a valuation model. However, their sample of expectational data was very limited.

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specifically, we will address the question of the role of actual future changes in earnings on stock returns, the role of expected changes in earnings, and finally the role of changes in expectations.

In addition to examining the importance of expectations and earnings, we briefly explore the issue of the scale of returns that can be earned by being "more accurate" than average forecasts. If market prices reflect average expectations, then superior forecasting ability should be rewarded with excess returns. We will explore both the size of these returns and the timing of their occurrence.

2. Overview: Variables Examined and Sample Design

The testing of the impact of earnings expectations has awaited the development of a broad consistent data base. Lynch, Jones and Ryan have constructed a data base which contains one and two-year consensus earnings estimates on all corporations followed by one or more analysts at most major brokerage firms.[2] Lynch, Jones, and Ryan define the consensus earnings estimate for any stock as a simple arithmetic average of the estimates prepared by all of the analysts following that stock. Given this data base, a study can be made of the role of average expectations in price formation and in particular the importance of earnings expectations in determining share price.

In order to study the role of expectations, we need some measure of the excess returns that can be earned from knowledge concerning future earnings. To examine this, we analyzed the actual growth rate in earnings. The actual growth rate was defined as actual earnings for the forecast year minus actual earnings in the previous fiscal year, divided by actual earnings in the previous fiscal year. This variable is computed only for those firms for which the denominator is positive. This does not bias the results of our tests as the denominator is known at the time this variable is formulated. However, the population of stocks to which our tests apply is restricted. Letting G_t stand for the growth rate in earnings,

$$G_t = \frac{E_t - E_{t-1}}{E_{t-1}} \quad \text{for } E_{t-1} > 0 \tag{1}$$

where E_t is reported earnings per share at time t.

Anticipating our results for a moment, we will find that knowledge of actual growth will allow a significant risk adjusted excess return to be earned. This indicates that growth in earnings is an important variable affecting share price, and that expectations concerning this variable are worth studying.

If expectations determine share price, then knowledge of the average value of these expectations should already be incorporated in the share price, and buying on the basis of average expectations should not lead to excess returns. Thus, the second variable we examined was the consensus forecast of the growth rate in per share

[2]Lynch, Jones and Ryan, a New York-based brokerage firm, have available in computer readable form consensus (average) earnings estimates updated monthly for the current and next fiscal year as well as forecasts of each individual analyst following each stock. They designate this as the I/B/E/S service. During the time period studied Lynch, Jones and Ryan surveyed brokerage firms. Our sample consisted of all stocks listed on the New York Stock Exchange which were followed by three or more analysts. The average number of analysts following each of these firms was slightly above seven. Furthermore, slightly less than 70 stocks were followed by ten or more analysts. The maximum number of analysts following any stock was 18.

earnings. We call this the forecasted growth rate. It is formulated as the consensus forecast of fiscal year earnings minus the actual earnings in the previous fiscal year divided by the actual earnings that occurred in the previous fiscal year. Since this measure cannot be interpreted for a negative denominator, it is computed only for those companies for which the denominator is positive. To be more explicit, let

$$FG_t = \frac{C_t - E_{t-1}}{E_{t-1}} \quad \text{for } E_{t-1} > 0, \tag{2}$$

where C_t is the consensus forecasts of the earnings per share that will occur at time t, and FG_t is the consensus forecast of the growth rate in earnings per share.

If expectations are important and are incorporated in present prices, then one should observe larger excess returns by having knowledge concerning the error in the growth estimate, than by knowing actual growth itself. Investment in a firm with high actual growth should not necessarily lead to excess returns unless investors were forecasting low growth. Thus, if expectations are important, knowledge concerning differences between actual growth and forecasted growth should lead to higher excess returns than knowledge concerning growth itself. Thus, the third variable we examine is actual growth minus forecasted growth. This differential growth can be expressed as

$$DG_t = G_t - FG_t. \tag{3}$$

Since the effect of differences between expectations and realizations is the key phenomena that we wish to study, we have measured this phenomena in two additional ways. The first is the error in the earnings forecast defined as the actual earnings in the forecast year minus the forecast earnings. If we denote this variable by M_t for misestimate in consensus forecast of earnings, then

$$M_t = E_t - C_t. \tag{4}$$

The second is the percentage forecast error, which is measured as the actual earnings in the forecast year minus the forecast earnings divided by the absolute value of the actual earnings. If we use $\%M_t$ to stand for the percentage, then

$$\%M_t = \frac{E_t - C_t}{|E_t|}. \tag{5}$$

While most of our analysis consists of an examination of one year forecasts, we decided to take a brief look at the excess returns associated with errors in two year forecasts. We duplicated the one-year measures and examined the error in earnings forecast for two years and the percentage error in earnings forecast for two years.

If consensus forecasts are more important than the actual level of future earnings in determining prices, then one should be able to do a better job of selecting stocks by knowing the change in consensus forecasts than by knowing actual earnings. To test this hypothesis, a variable measuring the percentage adjustment in forecasts over time was used. This variable is formulated as negative of the following quantity: the forecast of earnings prepared for the next (as opposed to this) fiscal year minus the forecast of earnings for the same fiscal year made one year later divided by this latter number. To better understand this variable, let ${}_{t-a}C_t$ stand for the consensus forecast for earnings at time t which are produced at time $t - a$, and ${}_{(t-a+12)}C_t$ stands for the forecast for time t which is produced 12 months later. Then the forecast revision denoted by FR_t can be represented as

$$FR_t = -\frac{{}_{(t-a)}C_t - {}_{(t-a+12)}C_t}{{}_{(t-a+12)}C_t}\,. \qquad (6)$$

3. The Sample

The raw data consisted of a monthly file of one and two-year earnings forecasts prepared in the years 1973, 1974, and 1975. We limited our sample of data in several ways. First, the sample was restricted to firms having fiscal years ending on December 31. By confining our sample to firms with fiscal years ending on the same date, forecasts prepared a certain number of months (e.g., nine) in advance of the end of the fiscal year, fall on the same calendar date. This procedure assures that the same general economic influences (e.g., the economy, the market, etc.) were available to all forecasters at the time forecasts were prepared. The date of December 31 was selected because more companies had fiscal years ending on that date than on any other.

Second, forecasts are restricted to two forecast dates, March and September. March was selected because it is the earliest date on which financial data for the previous fiscal year would be reported by most companies. September was selected as a month that is far enough from the first forecast and far enough into the fiscal year that significant evidence on companies' performance during the year should be available. Yet it is not so far into the year that earnings are known with certainty. Both dates are used for all variables involving one-year forecasts. However, so few two-year forecasts were available in March that only the September date could be used when examining two-year forecasts.

Finally, because we are interested in the impact of consensus forecasts, the sample was restricted to companies which were followed by three or more analysts. The consensus prepared from less than three forecasts could be idiosyncratic and not typical of broad feelings about the stock.

The final sample consisted of a total of 919 one-year forecasts of the fiscal years 1973, 1974, and 1975 and a total of 710 two-year forecasts of fiscal years 1974, 1975, and 1976. Because of negative earnings, some firms had to be eliminated over several measures. This caused the sample size to fall to as low as 913 and 696 for one and two-year forecasts, respectively. As discussed earlier Lynch, Jones and Ryan survey most large brokerage firms. Since we have included all stocks followed by three or more analysts, the group of stocks in our sample can be considered a universe of all stocks with important analyst interest. Since brokerage firms are interested in providing information to their customers, our sample should include most stocks of major institutional interest.

4. Methodology

The first step in our procedure was for each time period studied (March and September) and for each year to rank all stocks on each variable and to divide the stocks into deciles by each variable. For example, we formed deciles for the forecasted growth rates made in September 1973 with the first decile containing the 10% of the stocks with the highest forecasted growth rate. For each decile, we calculated the average value of the variable being studied (in this case, forecasted growth).

In order to determine whether certain types of information lead to excess returns, it is necessary to have a measure of what return is expected. If we have a measure of expected return, then excess return is the difference between actual return and expected return. In order to measure expected return, we use the market model. The market model is a relationship between the return on a security and the return on a market index.

Let

1. r_{it} be the return on portfolio i in period t.
2. r_{mt} be the return on the market in period t.
3. α_i and β_i be parameters for portfolio i.
4. e_{it} be deviations from the model.

The market model is:

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

Using the market model leads to expected returns being determined by the security's normal relationship with the market (β_i), the market return in the period (r_m) and the security's average nonmarket return (α_i). Using the market model excess return is

$$r_{it} - (\alpha_i + \beta_i r_{mt}).$$

Although the market model is frequently used in finance, there are some problems with its use that can lead to biased tests. First there is measurement error in the coefficients and if this varies systematically with the test statistic, it can lead to an appearance of a relationship when none exists. This was guarded against in several ways.

First we calculated the market model for the deciles discussed earlier. Using grouped data is one way of reducing the measurement error. The one variable where measurement error can be especially bothersome is beta. As Blume [1] has shown the error in measuring beta varies systematically with its difference from one. The use of grouped data helps. In addition, we examined the individual betas on the groups. There was no systematic pattern, nor did any group beta differ very much from one (the range was 0.93 to 1.09). Given this result, we judged that any further adjustment in beta was unnecessary. In the original CAPM tests grouping data was common. Litzenberger and Ramaswamy [7] and Ross and Roll [9] have criticized this on the grounds that the CAPM is a theory of the pricing of single assets and as such has to be shown to explain differences in asset returns. Our purpose here is not to test CAPM but rather to examine the effect of expectations on share price. Hence grouping is a reasonable procedure for dealing with measurement error.

The second problem in the use of the market model is its difference from a capital asset pricing model. There are numerous general equilibrium models that have been derived. If one of these ultimately is shown to be correct, then better estimates of returns should be obtained by using that model rather than the market model. Brennan [2] has shown that the use of alternative models can make some difference. However, in this study the magnitude of the results, the grouping techniques, and the spread in the β_i's should mean that there is minimal chance of this source of potential bias explaining the results.[3] For example, assuming that the beta for each group was equal to one would not change any of our conclusions.

[3] We could have used differences from R_m, rather than the market model in reporting our results. However the reader might then question to what extent our conclusions were due to differences in market risk. Alternatively we could have followed Watts [10] methodology to force the Beta on each Portfolio to be exactly one. However since the differences in Beta from one were neither large nor systematically related to any criteria across our deciles we did not take this additional step.

The market model was estimated by treating each decile as an equally weighted portfolio of the stocks which composed it and estimating the market model parameters for each decile. The market index we used was the Standard and Poor's index adjusted for dividends. The parameters of the model were estimated in each case using 60 monthly observations on returns up to and including the forecast month. The data dissemination procedure followed by Lynch Jones and Ryan means that forecasts are in the hands of the subscriber by the end of the month. The estimated parameters of the market model were then used in conjunction with actual market returns to forecast normal risk adjusted returns for each of the deciles during each of the 24 months after the forecast month. The risk adjusted returns in each month were close to but not exactly equal to zero. This should not be surprising to the reader. The sum of the residuals in any one month should equal zero only if they are weighted in market proportions and include all stocks in the index. Our sample meets neither of these conditions. We adjusted our residuals to have a mean (across all deciles) of zero for ease of presentation. Our primary statistical test is a *rank* correlation test, subtracting a constant from each entry can not effect the rank. Thus our adjustment had very little effect on the numbers reported and had no effect on their statistical significance or on our conclusions.

As discussed earlier, we calculated risk adjusted excess returns for each of the deciles for each of the variables for the 24 months after the forecast month. In the case of the March data we calculated risk adjusted excess returns from April on and in the case of September from October on. This was done for each of the three years for which we had data. We combined these years and have reported the average risk adjusted return across the three years for each decile.

To aid in understanding the results, we report the sum of the risk adjusted excess returns from the month after the forecast month to the month under consideration, rather than reporting the risk adjusted excess returns in any one month.[4] Thus, for March forecasts, the entry in month 3 is the sum of the risk adjusted excess returns earned in April, May, and June. This allows the reader to more easily determine the cumulative effect of any influence.

After examining the data we determined that there were no further effects after month 15 for March data and month 9 for September data. Thus, we have not reported results beyond these dates.

In reporting results we have combined the deciles in two ways. First, we report the cumulative risk adjusted excess returns in the upper 30%, middle 40%, and lowest 30% of firms ranked on each variable. Second, we report the cumulative risk adjusted excess returns in the upper 50%. Since the risk adjusted excess returns add to zero, across all deciles the risk adjusted excess return in the upper 50% is the negative of the lowest 50%. We chose to present the data in this way since using the ungrouped deciles increases the size of the tables substantially without providing additional insights.

The reader can judge the economic significance of the results by examining the cumulative residuals in Tables 1 through 4. These excess returns are reported before

[4]Many authors accumulate residuals by calculating the product of one plus the residuals. The justification for this is that return over N periods is the product of the N one period returns. There is a difficulty with this procedure. The null hypothesis is that the residuals average zero. If this hypothesis is true, it is easy to show that the product of one plus the one period residuals minus one becomes negative and significantly so as N gets large. The sum of the residuals is zero under the null hypothesis and deviations from zero are indications of real effects.

TABLE I

Time Series of Cumulative Excess Returns Ranked by Error in the Forecast of the Growth Rate (Equation (3)) for March Data

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Upper 30%	0.0166	0.0221	0.0221	0.0321	0.0630	0.0698	0.0767	0.0782	0.0855	0.0664	0.0729	0.0775	0.0909	0.0801	0.0897
Middle 40%	−0.0069	−0.0037	+0.0037	−0.0001	−0.0139	−0.0170	−0.0038	−0.0041	−0.0063	−0.0162	−0.0107	−0.0120	−0.0144	−0.0209	−0.0126
Bottom 30%	−0.0075	−0.0169	−0.0173	−0.0320	−0.0444	−0.0470	−0.0719	−0.0726	−0.0773	−0.0448	−0.0588	−0.0731	−0.0717	−0.0523	−0.0729
Rank Corre-lation[a]	0.71**	0.73**	0.76**	0.83*	0.83*	0.76**	0.84*	0.87*	0.89*	0.90*	0.85*	0.87*	0.93*	0.92*	0.89*

[a] Rank correlation coefficients
* Indicates significance at the 1% level.
** Indicates significance at the 5% level.

TABLE 2

Time Series of Cumulative Excess Returns for the Error in the Forecast of Growth Rate Using September Data (Equation (3))

	1	2	3	4	5	6	7	8	9
Upper 30%	0.0187	0.0272	0.0421	0.0429	0.0466	0.0506	0.0618	0.0638	0.0680
Middle 40%	0.0100	0.0092	0.0014	−0.0035	−0.0036	−0.0045	−0.0069	−0.0065	−0.0034
Lower 30%	−0.0318	−0.0394	−0.0441	−0.0384	−0.0421	−0.0445	−0.0526	−0.0550	−0.0635
Rank Correlation[a]	0.77*	0.88*	0.84*	0.88*	0.99*	0.92*	0.95*	0.94*	0.85*

[a]Rank correlation coefficients are computed across deciles.
*Indicates significance at 1% level.
**Indicates significance at 5% level.

TABLE 3

Excess Returns for Months 7 and 13 March Data

Time of Analysis		Forecasted Growth Equation (2)	Actual Growth Equation (1)	Error in Growth Equation (3)	Error in Forecast (One Year) Equation (4)	Percentage Error in Forecast Equation (5)
MONTH 7	Upper 30%	−0.0064	+0.0591	+0.0767	0.0633	+0.0711
	Middle 40%	0.0068	0.0006	−0.0033	0.0092	−0.0033
	Lower 30%	−0.0028	−0.0597	−0.0719	−0.0754	−0.0719
	Upper 50%	−0.0080	0.0463	0.0426	0.0462	0.0426
	Rank Correlation[a]	−0.35	0.90*	0.84*	0.98*	0.90*
MONTH 13	Upper 30%	+0.0006	+0.0748	+0.0908	+0.0715	+0.0861
	Middle 40%	−0.0093	−0.0191	−0.0144	+0.0022	−0.0156
	Lower 30%	+0.0019	−0.0493	−0.0717	−0.0743	−0.0651
	Upper 50%	−0.0139	0.0411	0.0577	0.0571	0.0554
	Rank Correlation[a]	−0.30	0.88*	0.93*	0.96*	0.85*

[a]Rank Correlation coefficients are computed across deciles.
*Indicates significance at the 1% level.
**Indicates significance at the 5% level.

TABLE 4

Excess Returns for Month 7 from September Data

	Forecasted Growth Equation (1)	Actual Growth Equation (2)	Error in Growth Equation (3)	Error in Forecast (One Year) Equation (4)	Error in Forecast (One Year) Equation (5)	Error in Forecast (Two Years) Equation (4)	Error in Forecast (Two Years) Equation (5)	Forecast Revision Equation (6)
Upper 30%	0.0135	0.0399	0.0618	0.0567	0.0652	0.0773	0.0792	0.0889
Middle 40%	− 0.0079	− 0.0161	− 0.0069	− 0.0053	− 0.0084	− 0.0023	− 0.0062	− 0.0141
Lower 30%	− 0.0029	− 0.0186	− 0.0526	− 0.0497	− 0.0541	− 0.0741	− 0.0711	− 0.0701
Upper 50%	0.0073	0.0245	0.0405	0.0402	0.0409	0.0496	0.0498	0.0512
Rank Correlation*	0.37	0.53	0.95*	0.95*	0.89*	0.96*	0.98*	0.83*

*Rank correlation coefficients are computed across deciles.
*Indicates significance at the 1% level.
**Indicates significance at the 10% level.

TABLE 5

Mean Values for Each Variable

	Equat. (1) Forecasted Growth	Equat. (2) Actual Growth	Equat. (3) Error in Growth	Equat. (4) Forecast Error (1 yr)	Equat. (5) Percentage Forecast Error (1 yr)	Equat. (4) Percentage Forecast Error (2 yrs)	Equat. (5) Percentage Forecast Error (2 yrs)	Equat. (6) Forecast Revision
March Data								
Upper 30%	56.61%	107.45%	63.62%	1.08%	26.24%			
Middle 40%	6.9	8.27	1.35	0.01	− 0.32			
Lower 30%	− 9.16	− 34.95	− 38.88	1.05	− 159.24			
Sept. Data								
Upper 30%	81%	98.83%	26.36%	0.53%	14.72%	0.13%	26.74%	43.76%
Middle 40%	9.34	8.32	− 0.17	− 0.07	− 0.23	− 0.09	− 3.75	1.19
Lower 30%	− 15.75	− 32.95	− 27.02	− 0.67	− 94.01	− 1.64	− 155.29	− 27.34

transaction costs. While estimates of round trip transaction costs differ, a reasonable estimate is in the range of two to four percent. Thus, cumulative residuals in excess of 4% can be accepted as of economic significance.

It is also logical to examine whether the relationship between any of the variables under study and excess return is statistically significant. This was examined by computing Spearman rank order correlation coefficient between the decile and the rank order of the cumulative excess return for each decile. A statistically significant rank order correlation coefficient would indicate that there was a significant relationship between the variable under study and cumulative excess returns. Furthermore, by using a nonparametric test this statement is free of any distributional assumptions (across deciles) about the pattern of excess returns and/or the variables under study. Note that when we compute, the statistical significance of the cumulated residuals in successive periods these tests are not independent.

Table 5 presents the average values for each variable studied in this paper.

5. Results

The first question to analyze is: Can an investor earn excess returns by selecting stocks on the basis of the consensus growth rate forecasted by security analysts (Equation (2))? The answer is no. There is no discernable pattern in the cumulative excess returns. In some months the stocks for which high growth was forecasted had positive risk adjusted cumulative excess returns; in other months they had negative ones. As a further check we performed a rank order correlation test on the deciles in each month. The rank order correlation between forecasted growth and risk adjusted cumulative excess return was never significantly different from zero at the 1% level and only significantly different from zero from the 5% level in two months. In the months it was significant it was negative, which is opposite to what one would expect if growth estimates contained information which was not incorporated in stock prices. The lack of a pattern was even more evident in the September data. In no month was the cumulative excess return significantly different from zero at even the 5% level and the average cumulative excess return varied frequently from positive to negative. The results for each individual month is not reported in the paper but the results for selected months can be seen by examining Tables 3 and 4.

This lack of risk adjusted excess returns occurs even though the analysts were projecting some very large growth rates. In September the analysts were projecting that the average growth rate for the top decile would be over 100% and the growth rate in the second decile would be 33%. In contrast the earnings of stocks in the last decile were expected to decline by 34%.

A number of financial institutions purchase growth stocks as an investment strategy. In the three years we examined, pursuing such a strategy based on consensus estimates would not have led to superior returns, growth forecasts were already incorporated in the security prices. This is what one would expect if expectations are incorporated into security price.

On the other hand, our results show that growth is an important determinant of security returns. Investors with perfect forecasting ability could make risk adjusted excess returns. The results for individual months are not reported. However, the results for selected months, can be seen by examining Tables 3 and 4. From month 4 on, the rank order of excess returns for the deciles is significant at the 1% level. The excess return builds up to 7.23% for the upper 30% of all stocks by month 9. It then declines and builds up again to over 7%. A similar but less distinct pattern can be seen by examining the lowest 30%.

The risk adjusted excess returns from possessing perfect forecasting ability in September are much lower than they were from possessing perfect forecasting ability in March. Furthermore in most months the rank order of the deciles is insignificant at the 1% level (although it's still sometimes significant at the 5% level). This is what one would expect. By September investors have a much better idea of actual growth than they do in March.

If prices reflect consensus forecasts, then knowing the error in the consensus estimate of growth should lead to larger profits than just knowing actual growth. How large is the mis-estimate of actual growth by the analysts? In March, the average error for the 30% of the companies for which earnings growth was most underestimated was 63.6%, while the average error for the 30% of the companies for which growth was most overestimated was 38.9%. The corresponding numbers for September forecasts are 26.4% and 20.3%. It is apparent that while there are still large size errors in the September forecasts, the size of the error has decreased markedly between March and September. Analysts can improve the accuracy of their forecasts as interim earnings reports or as other information comes out and more information is available on company performance.

Tables 1 and 2 show the time series of cumulative risk adjusted excess return for the errors in the March and September estimates (Equation (3)). The rank order of the deciles is significant from the first month for both the September and March estimates.

The risk adjusted excess returns build up very quickly in both cases. For the March forecasts, the risk adjusted excess returns are close to 7% by month 6 (September), the major increase occurring in month 5. Once again, the risk adjusted excess returns have a temporary peak in month 9 and then increase to a global peak in month 13. This rapid build-up is consistent with information about true earnings growth being disseminated over time and the market correctly incorporating the information.

Even in September investors with a better estimate of growth than the consensus had an opportunity for excess profits. Notice that while knowledge of the forecast error as of September allows an excess profit to be earned, perfect forecast ability did not allow an excess profit to be earned. This suggests that on average forecasts are accurate enough in September that excess profits can be earned only by isolating those cases where forecasted growth is very much different than actual.

The time pattern for all variables is very similar with March forecasts producing excess returns which level out after month 13 and September forecasts producing excess returns which level out after month 7. Consequently, we shall only report results for these months. The cumulated excess returns in these months are reported in Table 3 and Table 4. In addition, in Table 3 we show the risk adjusted cumulative excess returns 7 months after the March forecasts for comparison with the effect 7 months after the September forecast.

Note that among the variables discussed so far for both March and September forecasts, the risk adjusted excess return was highest for the error in the growth rate, next highest for actual growth and close to zero for the forecasted growth. What an investor desirous of making excess profits should be most concerned with is finding securities where his forecasts are not only good in the sense of being right but where they are both accurate and different from the consensus.

The same conclusion can be reached by examining errors in the earnings estimates. Tables 3 and 4 present the analysis of excess returns for the error in forecast earnings and the percentage error in earnings forecasts for one year forecasts as of March and September and two-year forecasts as of September. In each case the excess returns appear to be sufficient to cover transaction costs and the rank order correlation coefficient is significant at the 1% level.

Furthermore, the amount of excess returns that can be earned vary with the magnitude of the forecast error. The two-year estimates made in September and the one-year estimates made in March were considerably less accurate than the one-year forecast made in September. They also produced higher risk adjusted excess returns. However, even in September there is a considerable forecast error in year-end earnings. In September, the percentage forecast error was 26% for the top decile, 11.6% in the next decile, and 6.3% in the next. These errors, while lower, were still significant enough to lead to an excess risk adjusted return.

We have now examined evidence that consensus forecasts are incorporated into price. Further, we have seen that the ability to forecast with more accuracy than the consensus forecast can lead to an excess risk adjusted return. If consensus forecasts play a major role in price determination, then the ability to forecast consensus forecasts themselves should lead to a superior return. Since we have estimates of the earnings for each company made 15 months in advance (the two-year forecast as of September) and estimates of the same earnings made 12 months later (one-year forecast made in September of the following year), we can measure the impact of being able to forecast the change in the estimate (Equation (6)). As shown in Table 4, the

TABLE 6
*Error in Growth**
(Forecast-actual)

Percentage of Firms eliminated	Excess return if completely accurate	Excess return if 50% error	Excess return if 90% error
0%	0	0	0
10%	1.56	0.78	0.16
20%	2.88	1.44	0.29
30%	3.07	1.53	0.31
40%	4.32	2.16	0.43
50%	5.77	2.88	0.58
60%	7.35	3.67	0.74
70%	9.08	4.54	0.91
80%	9.90	4.95	0.99
90%	10.42	5.21	1.04

*Forecasts of one year growth rates prepared in March. Cumulative returns calculated as of April of the following year.

returns from being able to estimate forecast revision are substantial. In fact, the return from forecasting future forecasts themselves is higher than the return from being able to forecast actual earnings. This is consistent with our other evidence that it is consensus forecasts which determine security prices.

All of the results presented in this section could be used to analyze the amount of accuracy necessary to earn excess returns. Assume the analysts can identify firms that are in various deciles with respect to the error in estimated earnings. For example, suppose he could identify the 10% of the firms with the largest forecast error. Column 2 of Table 6 shows the cumulative excess return he would earn. Columns 3 and 4 assumes that he identifies the members of a decile with error. Column 3 assumes that 50% of the time he identifies a firm as a member of a decile he is randomly selecting from among all firms and 50% of the time he is accurate. Column 4 assumes that 90% of the time he is randomly selecting from all firms.

For example, if an analyst is attempting to select from among the 30% of the firms for which the consensus forecast most underestimate true earnings, and he is right 50% of the time, he will earn an excess risk adjusted return of 4.54%.

As can be seen from an examination of the table, a little bit of information leads to substantial cumulative excess returns. These kinds of excess returns provide some justification for the effort undertaken by many organizations to forecast earnings.

6. Conclusions

In this study we present evidence in support of the hypothesis that expectations are incorporated into security prices. In addition, we have analyzed the timing and size of returns from forecasts which are more accurate than the consensus. Since prices reflect consensus forecasts, the payoff from being accurate in forecasting is increased markedly as the consensus forecast becomes inaccurate. Finally, we have demonstrated that the payoff from being able to forecast the consensus estimate is higher than the payoff from being able to forecast earnings. The market reacts to expectational data. But despite this, or rather because of it Lord Keynes [6] appears to have been right when he likened professional investing to participating in a newspaper contest on a beauty contest, where "... each competitor has to pick, not those faces which he himself finds prettiest, but those which he thinks likeliest to catch the fancy of other competitors, all of whom are looking at the contest from the same point of view."

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Choice Among Methods Of Estimation Share Yield
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Choice among methods of estimating share yield

The search for the growth component in the discounted cash flow model.

David A. Gordon, Myron J. Gordon, and Lawrence I. Gould

The yield at which a share of stock is selling, also called its expected return or required return, is an important statistic in finance. Firms use it in choosing among investment opportunities and financing alternatives, and investors use it in making portfolio decisions. Nevertheless, the yield at which a share is selling is a difficult quantity to measure, which has limited its use in the practice of finance. This paper develops and tests a basis for choice among alternative methods of estimating a share's yield

A share's yield, like a bond's yield, is the discount rate that equates its expected future payments with its current price. A bond's yield is easy to measure under the common practice of ignoring default risk, as the future payments are then known with certainty. The future payments on a share, however, are dividends and market price, and these payments are uncertain.

The common practice is to represent these future dividend payments with estimates of two numbers: One is the coming dividend, and the other is a growth rate. The latter can be an estimate of the long-run growth rate in the dividend or of the growth rate in price over the coming period. In the latter case, the estimate is called the expected holding-period return (EHPR); in the former case, it is called the discounted cash flow yield (DCFY).[1] In either case, the estimate of a share's yield reduces to the sum of its dividend yield and a future growth rate, with the latter inferred in some way from historical data.

There is a wide variety of acceptable methods for using historical data to estimate future growth. This variation in method is illustrated in the testimony of expert witnesses before public utility commissions on the fair return for a public utility. In these cases, the estimates and the methods used are a matter of public record. Some idea of the various methods can be found in Morin (1984) and Kolbe, Read, and Hall (1984). The performance of alternative estimating methods has been examined in Gordon (1974), Kolbe, Read, and Hall (1984), Brigham, Shome, and Vinson (1985), and Harris (1986).

We have derived our basis for comparing the accuracy of alternative methods for estimating the DCFY on a share from the generally accepted propositions that yield should vary according to risk, and that beta is the best estimate of risk. Hence, the DCFY should vary among shares with beta, and, between two methods for estimating growth, the superior method is the one for which the variation in yield among shares is explained better by the variation in beta among the shares.

First we present simple, plausible, and objective measurement rules for implementing four popular and/or attractive methods for estimating the DCFY. We then describe how sample statistics may be used to judge the accuracy of each method. We also describe how the CAPM model has been used to estimate share yield and explain why we do not compare it with the various DCFY methods. The following section carries out the comparison with samples of utility and industrial shares, and the last section pre-

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sents the conclusions that may be drawn from the findings.

ALTERNATIVE MEASUREMENT RULES FOR A SHARE'S YIELD

Under the DCF method or model for estimating the expected return on a stock, the yield for the jth stock is:

$$DCFY_{jt} = DYD_{jt} + GR_{jt}, \quad (1)$$

where:

$DCFY_{jt}$ = DCF yield on the jth stock at time t,

DYD_{jt} = dividend yield on the jth stock at time t, and

GR_{jt} = long-run growth rate in the dividend on the jth stock that investors expect at time t.

In what follows, we omit the time and firm subscripts on the variables when they are not required. Also, DCFY will refer to the unknown true yield on a share.

The difficult problem in arriving at the DCFY is estimation of the long-run growth rate that investors expect. Four estimates of that quantity are:

EGR = rate of growth in earnings per share over a prior time period, usually the last five years;

DGR = rate of growth in dividend per share over a prior time period, usually the last five years;

FRG = consensus among security analyst forecasts of the growth rate in earnings, over the next five years; and

BRG = an average over the prior five years of the product of the retention rate b and rate of return on common equity r on a stock.

The estimate of share yield that incorporates each of these estimates of growth is denoted KEGR, KDGR, KFRG, and KBRG, respectively.

A case can be made for each of the four methods for estimating growth. KEGR, KDGR, and KBRG have been widely used in public utility testimony and in research on stock valuation models. The rationale for KEGR is the belief that the past growth rate in earnings is the best predictor of future growth in earnings and dividends. The rationale for KDGR is that the future growth rate in dividends is the statistic we want to estimate, and the past dividend record is free of the noise in past earnings.[2] The rationale for KBRG is that all variables will grow at this rate if the firm earns r and retains b. Furthermore, as Gordon and Gould (1980) show, KEGR and KDGR will be biased in one direction or another if r and b have changed over the last five years. As for KFRG, security analysts are professionals employed to forecast future performance; their forecasts are widely accepted by investors. The IBES collection of forecast growth rates of security analysts compiled by Lynch, Jones, and Ryan has increased the popularity of this estimate.

As stated earlier, we may also take the yield on a share as the sum of the dividend yield and the expected rate of growth in price over the coming period. This estimate of a share's yield is widely used in testing the CAPM, with the average HPR over the prior five years commonly used in such empirical work. On the other hand, this estimate of a share's yield varies so widely among firms and over time as to be patently in error as an estimate of share yield.[3]

BASIS OF COMPARISON

To compare the accuracy of the four estimates of the DCFY stated above, we regress the data under each estimate on beta for a sample of shares. If KEGR is the estimate,

$$KEGR_j = \alpha_0 + \alpha_1 BETA_j + \epsilon_j \quad (2)$$

The rationale for this expression lies in the risk premium theory of share yield, where the share yield is equal to the interest rate plus a risk premium that varies with the share's relative risk. Hence, if BETA is an error-free index of relative risk, α_0 is equal to the interest rate, and α_1 is the risk premium on the market portfolio or standard share.[4]

The higher the correlation between KEGR and BETA, assuming that α_1 is positive, the greater the confidence we may have in KEGR as an estimate of DCFY. We cannot rely solely on the correlation, though, in selecting among the methods for estimating DCFY. Errors in KEGR as a basis for estimating the DCFY on the jth share have random and systematic components. The former is ϵ_j, and its average value can be taken as the root mean square error of the regression (MSE). The larger the root MSE of the regression, the less attractive KEGR is as an estimate of share yield, because the error makes the problem of choice between $KEGR_j$ and $KEGR_j - \epsilon_j$ more acute. (That problem will be discussed shortly.)

The systematic error is the difference between the unknown true yield on the jth share, $DCFY_j$, and the value predicted by Equation (2). There is no obvious measure of the systematic error, as we do not know $DCFY_j$, but sample values of α_0 may provide information on its average value. The difference between α_0 and the interest rate is an indicator of systematic error, because the difference is zero under the risk premium theory. Error in the measurement of BETA biases α_0 upward, but, with the same BETA for each share used in all four regressions, differences in α_0 are indicators of systematic error.[5]

In addition to regression statistics, the sample mean and standard deviation of KEGR is a source of information on its accuracy as a method for the estimation of DCFY. If the mean departs radically from the long-term bond rate, or if the standard deviation indicates an unreasonable range of variation among shares, the accuracy of the method is open to question. Also, the sample mean may be a source of information on the systematic error for a method of estimation. Hence, sample values for the mean, standard deviation, correlation, root MSE, and constant term all contribute to a judgment on a method's accuracy for estimating the DCFY on a share. Unfortunately, there is no simple criterion for choice among the alternatives.

Once a conclusion is reached on the most accurate method for estimating DCFY — say, KEGR — we then have the problem of choice between $KEGR_j$ and $KEGR_j - \epsilon_j$ for the jth share. If the random error in $KEGR_j$ is due to error in its measurement for the jth share, we simply use the value predicted by Equation (2), which is $KEGR_j - \epsilon_j$. On the other hand, KEGR and DCFY may vary among shares with other (omitted) variables as well as BETA, in which case ϵ_j is also due to the omitted variables, and $KEGR_j$ may be the better estimate of DCFY. Unfortunately, we have no basis for choice among these two hypotheses, and the smaller the root MSE the less troublesome the problem of choice between them.

A more favorable tax treatment of capital gains over dividends should make investors prefer capital gains to dividends. As Brennan (1973) has shown, the yield investors require on a share would then vary with the excess of its dividend yield over the interest rate. To recognize this, Equation (2) becomes

$$KEGR_j = \alpha_0 + \alpha_1 BETA_j + \alpha_2 DMI_j + \epsilon_j, \quad (3)$$

with DMI_j the excess of the dividend yield over the interest rate for the jth firm. Although the tax effect should make α_2 positive, its information in DMI on share risk would tend to make α_2 negative. That is, dividend yield varies inversely with expected growth, and we would find α_2 negative insofar as growth is risky. To the extent that these two influences of the dividend yield offset each other, α_2 will tend toward zero.

The CAPM theory of how expected return varies among shares has been proposed as an alternative to the DCF model for measuring yield. Its value for the jth stock is

$$EHPR_j = INTR + BETA_j[EHPR_m - INTR], \quad (4)$$

where:

$EHPR_j$ = expected holding-period return on the jth share,

INTR = one-period risk-free interest rate,

$EHPR_m$ = expected holding-period return on the market portfolio.

There is an important difference between this CAPM model of share yield and the DCF model represented by Equation (1). The latter is merely an instrument for measuring share yield: There is nothing in the DCF model that explains the variation in yield among shares. The CAPM, on the other hand, is a theory on why and how yield varies among shares, but one must go outside of the theory to estimate the variables on the right-hand side of Equation (4). Given rules for estimating the variables, EHPR and BETA, empirical work then provides a joint test of the theory and the estimating rules, such as we are carrying out here.[6]

The CAPM nonetheless has been used to estimate share yield in testimony before regulatory commissions by assigning numbers to each of the quantities on the right-hand side of Equation (4). For INTR, a long-term bond yield is sometimes used instead of a one-period rate. BETA is estimated by conventional methods.

The big problem is the expected return on the market portfolio. Here the practice has been to use the average realized risk premium over a period of about fifty years as the estimate of $EHPR_m - INTR$ in Equation (4). Although the implicit assumption is that the risk premium is a constant over time, we would expect the premium to change from one period to the next for various reasons, among them changes in the interest rate, the risk premium on the market portfolio, and the relative taxation of interest and share income. Hence, this estimate of share yield is more or less in error at any particular time, but we have no way of estimating this error and comparing the method with the others.

COMPARATIVE PERFORMANCE

We carried out our empirical work with a sample of 75 large electric and gas utility firms and a sample of 244 firms that includes 169 industrial firms drawn from the S&P 400. We obtained share yield under the four methods for estimating it as of the start of the year for the years 1984, 1985, and 1986.

For the explanatory variables, BETA for each share on each date was obtained by regressing the monthly HPRs for the share on the monthly HPRs for the S&P 500 over the prior five years. DMI for a share is its dividend yield less the interest rate on the one-month Treasury bill at the start of each year. EGR and DGR are the growth rates in earnings and in dividends per share, respectively, over the prior five years as reported on the Value Line Tape. BRG is a weighted average of the retention growth rates over the prior five years,[7] and FRG is the average of forecast growth rates in earnings over the next five years reported by IBES. The corresponding estimates of share yield were obtained by adding the dividend yield at the start of each year to the estimate of growth.

Table 1 presents the statistics that we obtained with KBRG and KFRG as the estimates of DCFY for the sample of utility shares and of all shares. The means of KBRG for the utility shares seems reasonable, with the interest rate on ten-year government bonds the standard of comparison, the latter being 11.67%, 10.43%, and 9.19% at the start of 1984, 1985, and 1986, respectively.[8] The standard deviations for KBRG are small enough to make its range of variation well within the bounds of reason. The lower means for all shares reveal that the means for industrial shares are below the means for utility shares.[9] This casts doubt on the accuracy of KBRG as a basis for estimating the DCFY on industrial shares, because industrials are riskier than utility shares.

The beta model explains none of the variation in KBRG among utility shares, but the two-factor model is a substantial improvement. The DMI coefficient, α_2, is positive and significant in every year, meaning that the unfavorable tax effect of a high dividend yield dominates the favorable risk effect. The coefficient on BETA is positive and significant in two of the three years. The only disturbing feature of the data is the sharp fall in R^2 and the corresponding rise in the root MSE relative to the standard deviation of KBRG as we go from 1984 to 1986.

The KBRG statistics for all shares are substantially inferior to the utility share statistics. This forces the unhappy conclusion that, for industrial shares, BETA is a poor measure of risk, or KBRG is a poor measure of DCFY, or both.

The KFRG statistics for the utility sample are superior to the KBRG statistics. The means are reasonable under the two criteria of being above the interest rate and moving with it. The range of variation of KFRG suggested by its standard deviations seems reasonable. The statistics for the beta model are a slight improvement on the corresponding statistics for KBRG. Furthermore, the two-factor model does a good job of explaining the variation in KFRG among

TABLE 1

Sample and Regression Statistics for KBRG and KFRG, Utility Shares and All Shares, 1984, 1985, and 1986

	KBRG			KFRG		
	1984	1985	1986	1984	1985	1986
			UTILITY SHARES (75)			
Mean	14 84	14 38	12.93	15 64	14.56	12.93
Standard Deviation	2 51	1 87	1 80	2 26	1.43	1 42
Beta Model α_0	14 26	13 96	13 05	15 14	13.48	12.74
α_1	1 44	1.21	−0.28	1 25	3 09	0 42
t-statistic	(0 97)	(1 12)	(0 19)	(0 93)	(4 14)	(0 37)
Root MSE	2 52	1 87	1.81	2 26	1 29	1 43
R^2	0 013	0 017	0 001	0 012	0.190	0 002
Two-Factor Model α_0	12.45	12 75	12.42	13 30	12 46	11 97
α_1	3.45	2 11	0.11	3 28	3.85	0 89
t-statistic	(3 13)	(2.19)	(0 08)	(3 83)	(6 33)	(0 88)
α_2	0 68	0 45	0 34	0 68	0 38	0 41
t-statistic	(8 22)	(4 88)	(2 81)	(10 73)	(6 52)	(4 65)
Root MSE	1 82	1 63	1.73	1 41	1 03	1 26
R^2	0 491	0 262	0 100	0 620	0 491	0 232
			ALL SHARES (244)			
Mean	12 98	13 19	11 86	16 17	15 87	14 31
Standard Deviation	3 86	3 21	3 52	2.60	2.32	2.30
Beta Model α_0	15 00	14 71	13 90	15 56	14.50	12.57
α_1	−2 47	−1 91	−2.40	0 74	1.72	2 05
t-statistic	(4 23)	(4 15)	(4.25)	(1 83)	(5.29)	(5 70)
Root MSE	3 73	3.10	3.40	2 59	2 20	2 16
R^2	0 069	0 066	0.069	0 014	0 104	0 118
Two-Factor Model α_0	14.34	14 42	13 95	15 40	14.61	12 75
α_1	0.09	−1.18	−2 51	1 37	1.44	1 61
t-statistic	(0 13)	(2.04)	(3 45)	(2.69)	(3.52)	(3 49)
α_2	0 48	0 17	−0 02	0 12	−0.06	−0 10
t-statistic	(6 04)	(2 09)	(0 24)	(2 01)	(1.12)	(1 53)
Root MSE	3 49	3 08	3.41	2.57	2.20	2 16
R^2	0 191	0 083	0 070	0.030	0 108	0 127

utility shares. The R^2s are higher here than for KBRG in every year. Finally, α_2 is positive and significant in every year, and α_1 is not significant only in 1986.

The implicit means of KFRG for the industrial shares seem high but not beyond reason. On the other hand, the regression statistics for the all-shares sample are not good, which leads to the same unhappy conclusion for industrial shares as we reached for KBRG.

Table 2 presents the statistics that we obtained using KEGR and KDGR as estimates of the DCFY on the shares in our samples. Comparison of the regression statistics with those in Table 1 reveals that KEGR and KDGR, particularly the former, fall short by a wide margin of the performance of KBRG and KFRG as estimates of the DCFY on a share.

CONCLUSION

We have compared the accuracy of four methods for estimating the growth component of the discounted cash flow yield on a share: past growth rate in earnings (KEGR), past growth rate in dividends (KDGR), past retention growth rate (KBRG), and forecasts of growth by security analysts (KFRG). Criteria for the comparison were the reasonableness of sample means and standard deviations and the success of beta and dividend yield in explaining the variation in DCF yield among shares. For our sample of utility shares, KFRG performed well, with KBRG, KDGR, and KEGR following in that order, and with KEGR a distant fourth. If we had used past growth in price, it would have been an even more distant fifth. Nevertheless, none of the four estimates of growth performed well under the criteria for a sample that included industrial shares.

Before closing, we have three observations to make. First, the superior performance by KFRG should come as no surprise. All four estimates of growth rely upon past data, but in the case of KFRG a larger body of past data is used, filtered through a group of security analysts who adjust for abnormalities that are not considered relevant for future growth. We assume this is done by any analyst who develops retention growth estimates of yield for a firm. If we had done this for all seventy-five firms in our utility sample, it is likely that the correlations

TABLE 2

Sample and Regression Statistics for KEGR and KDGR, Utility Shares and All Shares, 1984, 1985, and 1986

	KEGR 1984	KEGR 1985	KEGR 1986	KDGR 1984	KDGR 1985	KDGR 1986
			UTILITY SHARES (75)			
Mean	16 16	0 32	14.91	16 49	15 76	14 13
Standard Deviation	3 31	3.47	4.66	3 12	2.41	2.21
Beta Model α_0	15 45	16 18	0.51	15.75	14 53	12 30
α_1	1 75	0 40	−7.87	1 83	3.53	3 99
t-statistic	(0 89)	(0 20)	(2 16)	(0 99)	(2.64)	(2 32)
Root MSE	3.32	3.49	4 55	3 12	2 32	2 15
R^2	0.010	0.001	0 060	0.013	0 087	0 069
Two-Factor Model α_0	14 20	15 83	18.76	14 10	13.56	12 64
α_1	3 13	0.66	−8.03	3.65	4 25	3.78
t-statistic	(1.66)	(0.32)	(2.18)	(2 23)	(3 26)	(2 20)
α_2	0.47	0.13	−0.13	0.61	0 35	−0 18
t-statistic	(3 32)	(0.66)	(0.42)	(5.02)	(2 86)	(1.21)
Root MSE	3 11	3 50	4.58	2.70	2 21	2 14
R^2	0 142	0.007	0 063	0 269	0 180	0.087
			ALL SHARES (244)			
Mean	11.14	9 42	7.88	15.08	13.63	11.35
Standard Deviation	10.67	11 67	11 45	6 08	6 30	6.71
Beta Model α_0	15.96	18.28	19 55	15 15	0 04	15 39
α_1	−5.90	−11 16	−13.70	−0 09	−1.78	−4.74
t-statistic	(3.62)	(7 07)	(8.10)	(0 09)	(1 92)	(4 41)
Root MSE	10 41	10.65	10 18	6 09	6 27	6.47
R^2	0.051	0.171	0 213	0.000	0.015	0 074
Two-Factor Model α_0	14 84	18.01	19.91	14.31	14 11	14.79
α_1	−1 56	−10 49	−14.62	3 17	0 63	−3.25
t-statistic	(0 77)	(5.27)	(6 72)	(2.73)	(0 55)	(2 36)
α_2	0 81	0 15	−0 21	0 61	0.55	0.34
t-statistic	(3 51)	(0.55)	(0.67)	(4 57)	(3.47)	(1 72)
Root MSE	10 18	10 67	10.19	5 86	6 13	6.45
R^2	0.097	0 172	0 215	0 080	0.062	0 085

would have been as good or better than those obtained with the analyst forecasts of growth.

Second, we examined shares and not portfolios, because our objective is to estimate the DCFY for shares and not for portfolios. As common practice in testing the CAPM has been to execute tests on portfolios instead of shares, we classified our population of shares into ten portfolios on the basis of their beta values. Regression statistics were substantially unchanged, except that correlations increased dramatically.

Finally, we must acknowledge that we have no basis for estimating the expected HPR or DCF yield for industrial shares with any confidence. Theories on financial decision-making in industrial corporations that rely on that statistic have a weak empirical foundation.

[1] The EHPR is a one-period return, while the DCFY is a yield to maturity measure. The two may differ in actuality because of measurement problems, but they also may differ in theory. That is, they may differ in the same way that interest rates on bonds of different maturities may differ. See Gordon and Gould (1984a). This source of difference between EHPR and DCFY will be ignored here.

[2] A widely accepted hypothesis is that dividends contain information on earnings, because management sets the dividend to pay out a stable fraction of normal or permanent earnings.

[3] Over a five-year period, there may even be a negative rate of growth in price for a large number of firms. Furthermore, this negative growth rate may be larger in absolute value than the dividend yield, which leads to the conclusion that investors are holding such shares to earn a negative return. The frequency of negative rates of growth in price is reduced as the prior time period used in its calculation increases in length. As that takes place, however, the estimate of the expected return for a firm approaches a constant or a constant plus the dividend yield. The expected return on a share is one statistic for which it is an error to assume that expectations are on average realized.

[4] Equation (2) is similar to the CAPM according to Sharpe, Lintner, and Mossin. They arrived at this expression under very rigorous assumptions. The heuristic risk premium model is adequate for our purposes

[5] It may be thought that Theil's (1966) decomposition of the difference between the actual and predicted values of a variable can be used here, but in fact that decomposition applies to a different problem. It assumes that the observed (actual) past values of a variable are free of error, and it decomposes the error in a model that is employed to explain the past values. The purpose of Theil's decomposition is to cast light on the possible error in using the model to predict future values of the dependent variable. Our problem is to determine which set of observed values is closest to the true values, with the risk premium theory of share yield and BETA as the source of information on the true values. Theil's method would be appropriate for decomposing the difference between the actual and predicted values of the *realized* holding-period return on a share. The actual values here can be observed without error

[6] There is an enormous volume of empirical work devoted to discovering whether the theory is true, but this empirical work does not provide useful estimates of the EHPR on a share. To test the truth of Equation (4), the practice has been to regress EHPR on BETA for a sample of firms with the average realized HPR over the prior five or so years used as an estimate of the EHPR. Because of the large error in the realized HPR over a prior time period, as noted earlier, neither the actual values of the dependent variable nor the values predicted by the model are usable as estimates of share yield. See Fama and MacBeth (1973) and Friend, Westerfield, and Granito (1978).

[7] BRG for a year is earnings less dividend divided by the end-of-year book value. The estimate of the expected value as of the start of 1986 is 0.3BRG85 + 0.25BRG84 + 0.20BRG83 + 0.15BRG83 + 0.10BRG82. If any value of BRG was negative, it was set equal to zero.

[8] We expect the yields on shares to be above the risk-free interest rate, but with a high enough interest rate the more favorable tax treatment of shares can reduce the yield below the interest rate. Interest rates were not that high in these years. See Gordon and Gould (1984b)

[9] The statistics reported for all shares and for utility shares were also obtained for industrial shares. All methods of estimation performed so poorly for industrial shares, however, as to suggest no confidence can be placed in any of them. To save space, we do not present statistics for the industrial shares. Whatever we want to know about them can be deduced by comparing the data for all shares and utility shares.

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INVESTOR GROWTH EXPECTATIONS

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A study done by Vander Weide and Carleton in 1988[1] suggests that consensus analysts' forecast of future growth is superior to historically oriented growth measures in stock valuation process for domestic companies. We worked with one of the original authors of the study, Dr. James H. Vander Weide, and closely followed his suggestions and methodology to investigate whether the results still hold in more recent times (2001- 2003).

We used the following equation to determine which estimate of future growth (g) best predicts the firm's P/E ratio when combined with the dividend payout ratio, D/E, and risk variables, B, Cov, Stb, and Sa.

$$P/E = a_0(D/E) + a_1 g(\text{Growth}) + a_2 B(\text{Beta}) + a_3 Cov(\text{Interest Coverage Ratio}) + a_4 Stb(\text{Stability}) + a_5 Sa(\text{Std Dev}) + e$$

Data Description

Earnings Per Share: IBES consensus analyst estimate of the firm's earnings for the unreported year.

Price/Earnings Ratio: Closing stock price for the year divided by the consensus analyst earnings per share for the forthcoming year.

Dividends: Ratio of common dividends per share to the consensus analyst earnings forecast for the forthcoming fiscal year (D/E).

Historical Growth measures

- EPS Growth Rate: Determined by a log-linear least squares regression for the latest year, two years, three years, ..., and ten years.
- Dividend per Share Growth Rate: Determined by a log-linear least squares regression for the latest year, two years, three years, ..., and ten years.
- Book Value per Share Growth Rate: Common equity divided by the common shares outstanding. Determined by a log-linear least squares regression for the latest year, two years, three years, ..., and ten years.
- Cash Flow per Share Growth Rate: Ratio of gross cash flow to common shares outstanding. Determined by a log-linear least squares regression for the latest year, two years, three years, ..., and ten years.
- Plowback Growth: Firm's retention ratio for the current year times the firm's latest annual return on equity.
- 3yr Plowback Growth: Firm's three-year average retention ratio times the firm's three-year average return on equity.

Consensus Analysts' Forecasts

- Five-Year Earnings Per Share Growth: Mean analysts' forecast compiled by IBES.

[1] Vander Weide, J. H., and W. T. Carleton "Investor Growth Expectations: Analysts vs History" *The Journal of Portfolio Management*, Spring 1988, pp 78-82

Risk Variables

B: Beta, the firm's beta versus NYSE from Value Line.

Cov: The firm's pretax interest coverage ratio from Compustat.

Stb: Five-year historical earnings per share stability. Average absolute percentage difference between actual reported EPS and a 5yr historical EPS growth trend line from IBES.

Sa: The standard deviation of earnings per share estimate for the fiscal year from IBES.

We set five restrictions on the companies included in the study in order to be consistent with the original study and to obtain more meaningful results.

- Excluded all firms that IBES did not follow.
- Eliminated companies with:
  - Negative EPS during any of the years 1991-2003.
  - No dividend during any one of the years 1991-2003.
  - P/E ratio greater than 60 in years 2001-2003.
  - Less than five years of operating history.

The final universe consisted of 411 US firms, fifty-nine of which are utility companies.

Results

The study was performed in two stages.

Stage 1

In order to determine which historically oriented growth measure is most highly correlated with each firm's end-of-year P/E ratio, we computed spearman (rank) correlations between all forty-two historically oriented future growth measures and P/E.

The result of the stage 1 study is displayed in Table 1. Three-year plowback ratio has the highest correlation with P/E in 2001 and 2002, and five-year EPS growth rate has the highest correlation with P/E in 2003.

Table 1

Stage1 Results for Utility and Non-Utility Companies Combined

Correlations between Historically Based Growth Estimates by Year with P/E

Current Year		y1	y2	y3	y4	y5	y6	y7	y8	y9	y10
2001	EPS	0 232	0 210	0 145	0 122	0 059	0 034	-0 007	-0 076	-0 117	-0 154
	DPS	-0 243	-0 297	-0 296	-0 293	-0 313	-0 316	-0 336	-0 334	-0 329	-0 333
	BVPS	0 059	-0 017	-0 098	-0 138	-0 150	-0 182	-0 219	-0 259	-0 271	-0 273
	CFPS	0 092	0 092	0 087	0 042	-0 063	-0 102	-0 141	-0 193	-0 237	-0 262
	plowback	0 203									
	plowback3	0 308									
2002	EPS	-0 007	0 147	0 076	0 080	0 083	0 050	0 030	-0 018	-0 060	-0 089
	DPS	-0 126	-0 202	-0 251	-0 224	-0 215	-0 239	-0 232	-0 233	-0 211	-0 198
	BVPS	-0 036	-0 036	-0 078	-0 115	-0 114	-0 127	-0 152	-0 162	-0 175	-0 171
	CFPS	0 056	0 045	0 017	0 021	0 030	-0 024	-0 050	-0 080	-0 125	-0 162
	plowback	0 093									
	plowback3	0 180									
2003	EPS	0 073	0 084	0 214	0 231	0 244	0 228	0 182	0 158	0 104	0 049
	DPS	0 120	0 054	-0 001	-0 078	-0 090	-0 126	-0 152	-0 165	-0 183	-0 185
	BVPS	0 097	0 076	0 067	0 036	-0 045	-0 062	-0 063	-0 083	-0 105	-0 131
	CFPS	0 146	0 196	0 243	0 239	0 206	0 178	0 107	0 089	0 039	-0 022
	plowback	-0 017									
	plowback3	0 038									

We also independently examined utility and non-utility firms. Table 2 shows the result for the fifty-nine utility firms. Two-year growth in EPS has the highest correlation with P/E in 2001, four-year EPS has the highest correlation in 2002, and six-year EPS has the highest correlation in 2003.

Table 3 exhibits the result for the remaining non-utility firms. EPS one-year growth, two-year growth, and five-year growth has the highest correlation with P/E in 2001, 2002, and 2003, respectively.

Table 2

Stage1 Results for Utility Companies

Correlations between Historically Based Growth Estimates by Year with P/E

Current Year		y1	y2	y3	y4	y5	y6	y7	y8	y9	y10
2001	EPS	0 305	0 330	0 305	0 319	0 238	0 157	0 129	0 107	0 079	0 048
	DPS	-0 215	-0 321	-0 302	-0 294	-0 316	-0 281	-0 332	-0 414	-0 435	-0 429
	BVPS	0 164	0 137	0 147	-0 027	-0 072	-0 135	-0 117	-0 104	-0 106	-0 140
	CFPS	0 194	0 135	0 020	-0 018	-0 122	-0 157	-0 135	-0 134	-0 103	-0 219
	plowback	-0 143									
	plowback3	-0 027									
2002	EPS	-0 065	0 044	0 069	0 119	0 071	0 004	-0 038	-0 069	-0 061	-0 070
	DPS	-0 333	-0 327	-0 278	-0 313	-0 280	-0 321	-0 277	-0 226	-0 203	-0 210
	BVPS	-0 325	-0 239	-0 182	-0 177	-0 230	-0 237	-0 250	-0 247	-0 235	-0 235
	CFPS	-0 205	-0 132	-0 172	-0 166	-0 216	-0 289	-0 285	-0 265	-0 227	-0 218
	plowback	-0 151									
	plowback3	-0 133									
2003	EPS	0 010	0 136	0 186	0 263	0 365	0 367	0 344	0 343	0 309	0 302
	DPS	0 151	-0 029	-0 014	-0 022	-0 054	-0 117	-0 142	-0 137	-0 105	-0 092
	BVPS	0 212	0 060	0 047	0 019	0 003	0 040	0 022	0 005	0 003	-0 002
	CFPS	0 222	-0 046	0 173	0 115	0 165	0 100	0 017	0 077	0 057	0 077
	plowback	-0 365									
	plowback3	-0 403									

Table 3

Stage1 Results for Non-Utility Companies

Correlations between Historically Based Growth Estimates by Year with P/E

Current Year		y1	y2	y3	y4	y5	y6	y7	y8	y9	y10
2001	EPS	0.1843	0 1660	0 1293	0 1218	0 0873	0 0829	0 0618	0 0106	-0 0194	-0 0412
	DPS	-0 2036	-0 2211	-0 2042	-0 1935	-0 2098	-0 2066	-0 2186	-0 2155	-0 2046	-0 1975
	BVPS	0 0757	0 0084	-0 0791	-0 0997	-0 0916	-0 1146	-0 1388	-0 1783	-0 1866	-0 1823
	CFPS	0 0864	0 0710	0 0956	0 0704	-0 0033	-0 0162	-0 0366	-0 0747	-0 1186	-0 1325
	plowback	0 0781									
	plowback3	0 1781									
2002	EPS	0 0762	0.1767	0 0755	0 0817	0 0936	0 0757	0 0708	0 0316	-0 0011	-0 0254
	DPS	-0 0804	-0 1693	-0 2103	-0 1672	-0 1519	-0 1720	-0 1645	-0 1636	-0 1394	-0 1226
	BVPS	0 0527	0 0236	-0 0363	-0 0777	-0 0710	-0 0753	-0 0953	-0 1019	-0 1118	-0 1061
	CFPS	0 0905	0 0488	0 0143	0 0237	0 0563	0 0246	0 0097	-0 0079	-0 0458	-0 0821
	plowback	0 0634									
	plowback3	0 1306									
2003	EPS	0 1254	0 1783	0 2788	0 2689	0 2791	0 2622	0 2219	0 2039	0 1559	0 1090
	DPS	0 1810	0 1290	0 0655	-0 0128	-0 0101	-0 0400	-0 0630	-0 0772	-0 0930	-0 0952
	BVPS	0 1555	0 1740	0 1534	0 1056	0 0127	-0 0069	-0 0054	-0 0218	-0 0416	-0 0636
	CFPS	0 1479	0 2200	0 2512	0 2429	0 2004	0 1839	0 1349	0 1286	0 0892	0 0388
	plowback	-0 1109									
	plowback3	-0 0402									

Stage 2
We compared the multiple regression model of historical growth rate with the highest correlation to the P/E ratio from stage 1 to the five-year earnings per share growth forecast.

$$P/E = a_0(D/E) + a_1 g + a_2 B + a_3 Cov + a_4 Stb + a_5 Sa + e$$

The regression results are displayed in table 4. The results show that the consensus analysts' forecast of future growth better approximates the firm's P/E ratio, which is consistent with the results found by Vander Weide and Carleton. In both regressions, R^2 in the regression with the consensus analysts' forecast is higher than the R^2 in the regression with the historical growth.

Table 4
Stage2 Results for Utility and Non-Utility Companies Combined
Multiple Regression Results
P/E = a0 + a1 **D/E** + a2 **g** + a3 **B** + a4 **Cov** + a5 **Stb** + a6 **Sa**

Historical

	a0	a1	a2	a3	a4	a5	a6	Rsq	F Ratio
2001	10.43	8.46	10.79	6.79	0.02	-0.03	-18.83	0.20	13.90
	4.73	5.53	2.93	3.54	3.05	-3.06	-3.32		
2002	12.36	7.60	6.66	1.01	0.00	0.01	-32.48	0.15	9.46
	7.21	6.18	2.61	0.66	1.57	1.48	-4.04		
2003	13.34	5.96	9.87	5.27	0.01	-0.01	-20.46	0.24	17.61
	7.29	4.04	2.95	3.39	3.62	-1.31	-4.25		

Analysts' Forecasts

	a0	a1	a2	a3	a4	a5	a6	Rsq	F Ratio
2001	-1.26	16.14	144.75	-0.64	0.01	-0.03	-10.76	0.47	48.00
	-0.62	11.63	13.22	-0.38	3.07	-4.04	-2.29		
2002	3.37	13.37	106.07	-3.60	0.00	0.01	-21.85	0.35	29.73
	1.93	10.97	10.59	-2.57	1.25	1.50	-3.06		
2003	4.77	12.76	61.93	4.38	0.01	0.00	-19.41	0.33	26.38
	2.65	9.48	7.25	3.01	2.45	-0.81	-4.33		

*T-stats below the coefficients in smaller font

For utility companies shown in table 5, consensus analysts' forecast of future growth is superior to historically oriented growth in 2002 and 2003. R^2 is lower in the regression with the consensus analysts' forecast in 2001. For non-utility companies, we found that consensus analysts' forecast of future growth is superior to the alternative in all three years (table 6).

Table 5
Stage2 Results for Utility Companies

Multiple Regression Results

P/E = a0 + a1 **D/E** + a2 **g** + a3 **B** + a4 **Cov** + a5 **Stb** + a6 **Sa**

Historical

	a0	a1	a2	a3	a4	a5	a6	Rsq	F Ratio
2001	7 90	11 07	-11 19	-3 00	0 29	0 00	-9 37	0 44	6 38
	2 16	4.80	-5 71	-0.86	0 88	0.64	-1 51		
2002	13 87	7 00	-3 80	-6 89	0 56	0 00	-29 89	0 38	5 11
	4 02	3.54	-0 66	-2 01	1 48	0.42	-2 70		
2003	11 29	7 74	-1 65	-1 40	0 32	0 00	-5 69	0 25	2 68
	3 22	3.30	-0 23	-0.43	1 05	-0 73	-0 75		

Analysts' Forecasts

	a0	a1	a2	a3	a4	a5	a6	Rsq	F Ratio
2001	9 61	9 20	66 61	-7 92	0 50	-0 01	-12 83	0 27	2 95
	2 31	3.45	3 66	-1 86	1 31	-1 33	-1 76		
2002	12 43	7 86	50 74	-9 61	0 50	0 00	-24 94	0 48	7 56
	3 89	5.29	3 10	-2 94	1 50	0 17	-2 41		
2003	5 81	11 06	101 12	-1 69	-0 19	0 00	-4 75	0 50	7 81
	1 89	6.32	4 80	-0.58	-0 74	-0 22	-0 74		

*T-stats below the coefficients in smaller font

Table 6
Stage2 Results for Non-Utility Companies

Multiple Regression Results

P/E = a0 + a1 **D/E** + a2 **g** + a3 **B** + a4 **Cov** + a5 **Stb** + a6 **Sa**

Historical

	a0	a1	a2	a3	a4	a5	a6	Rsq	F Ratio
2001	15 90	8 39	2 82	3 53	0 02	-0 03	-21 05	0 21	12 45
	6 57	4 13	1 96	1 68	2 97	-2 14	-3 40		
2002	17 76	8 46	6 02	-3 06	0 00	0 02	-36 97	0 27	16 78
	9 39	5 19	3 28	-1 88	1 37	2.52	-4 31		
2003	14 24	9 86	8 85	3 46	0 01	0 00	-19 00	0 30	19 89
	7 49	5.89	2 49	2 11	3 23	-0 15	-3 73		

Analysts' Forecasts

	a0	a1	a2	a3	a4	a5	a6	Rsq	F Ratio
2001	-0 51	17 28	140 84	-1 06	0 01	-0 03	-8 63	0 44	36 00
	-0 22	11 21	10 73	-0.59	2 88	-2 62	-1 63		
2002	5 05	15 67	91 22	-4 06	0 00	0 02	-22 93	0 38	27 65
	2 48	11 23	7 66	-2.74	1 18	2 33	-2 87		
2003	7 25	14 47	45 60	3 47	0 01	0 00	-19 09	0 33	22 30
	3 56	9.42	4 68	2 20	2 36	-0 12	-3 89		

*T-stats below the coefficients in smaller font

Investor growth expectations: Analysts vs. history

Analysts' growth forecasts dominate past trends in predicting stock prices.

James H. Vander Weide and Willard T. Carleton

For the purposes of implementing the Discounted Cash Flow (DCF) cost of equity model, the analyst must know which growth estimate is embodied in the firm's stock price. A study by Cragg and Malkiel (1982) suggests that the stock valuation process embodies analysts' forecasts rather than historically based growth figures such as the ten-year historical growth in dividends per share or the five-year growth in book value per share. The Cragg and Malkiel study is based on data for the 1960s, however, a decade that was considerably more stable than the recent past.

As the issue of which growth rate to use in implementing the DCF model is so important to applications of the model, we decided to investigate whether the Cragg and Malkiel conclusions continue to hold in more recent periods. This paper describes the results of our study.

STATISTICAL MODEL

The DCF model suggests that the firm's stock price is equal to the present value of the stream of dividends that investors expect to receive from owning the firm's shares. Under the assumption that investors expect dividends to grow at a constant rate, g, in perpetuity, the stock price is given by the following simple expression:

$$P_s = \frac{D(1 + g)}{k - g} \qquad (1)$$

where:

P_s = current price per share of the firm's stock;

D = current annual dividend per share;

g = expected constant dividend growth rate; and

k = required return on the firm's stock

Dividing both sides of Equation (1) by the firm's current earnings, E, we obtain:

$$\frac{P_s}{E} = \frac{D}{E} \cdot \frac{(1 + g)}{k - g} \qquad (2)$$

Thus, the firm's price/earnings (P/E) ratio is a nonlinear function of the firm's dividend payout ratio (D/E), the expected growth in dividends (g), and the required rate of return.

To investigate what growth expectation is embodied in the firm's current stock price, it is more convenient to work with a linear approximation to Equation (2). Thus, we will assume that:

$$P/E = a_0(D/E) + a_1 g + a_2 k \qquad (3)$$

(Cragg and Malkiel found this assumption to be reasonable throughout their investigation.)

Furthermore, we will assume that the required

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rate of return, k, in Equation (3) depends on the values of the risk variables B, Cov, Rsq, and Sa, where B is the firm's Value Line beta; Cov is the firm's pretax interest coverage ratio; Rsq is a measure of the stability of the firm's five-year historical EPS; and Sa is the standard deviation of the consensus analysts' five-year EPS growth forecast for the firm. Finally, as the linear form of the P/E equation is only an approximation to the true P/E equation, and B, Cov, Rsq, and Sa are only proxies for k, we will add an error term, e, that represents the degree of approximation to the true relationship.

With these assumptions, the final form of our P/E equation is as follows:

$$P/E = a_0(D/E) + a_1 g + a_2 B + a_3 Cov + a_4 Rsq + a_5 Sa + e \quad (4)$$

The purpose of our study is to use more recent data to determine which of the popular approaches for estimating future growth in the Discounted Cash Flow model is embodied in the market price of the firm's shares

We estimated Equation (4) to determine which estimate of future growth, g, when combined with the payout ratio, D/E, and risk variables B, Cov, Rsq, and Sa, provides the best predictor of the firm's P/E ratio. To paraphrase Cragg and Malkiel, we would expect that growth estimates found in the best-fitting equation more closely approximate the expectation used by investors than those found in poorer-fitting equations.

DESCRIPTION OF DATA

Our data sets include both historically based measures of future growth and the consensus analysts' forecasts of five-year earnings growth supplied by the Institutional Brokers Estimate System of Lynch, Jones & Ryan (IBES). The data also include the firm's dividend payout ratio and various measures of the firm's risk. We include the latter items in the regression, along with earnings growth, to account for other variables that may affect the firm's stock price.

The data include:

Earnings Per Share. Because our goal is to determine which earnings variable is embodied in the firm's market price, we need to define this variable with care. Financial analysts who study a firm's financial results in detail generally prefer to "normalize" the firm's reported earnings for the effect of extraordinary items, such as write-offs of discontinued operations, or mergers and acquisitions. They also attempt, to the extent possible, to state earnings for different firms using a common set of accounting conventions.

We have defined "earnings" as the consensus analyst estimate (as reported by IBES) of the firm's earnings for the forthcoming year.[1] This definition approximates the normalized earnings that investors most likely have in mind when they make stock purchase and sell decisions. It implicitly incorporates the analysts' adjustments for differences in accounting treatment among firms and the effects of the business cycle on each firm's results of operations. Although we thought at first that this earnings estimate might be highly correlated with the analysts' five-year earnings growth forecasts, that was not the case. Thus, we avoided a potential spurious correlation problem.

Price/Earnings Ratio. Corresponding to our definition of "earnings," the price/earnings ratio (P/E) is calculated as the closing stock price for the year divided by the consensus analyst earnings forecast for the forthcoming fiscal year.

Dividends. Dividends per share represent the common dividends declared per share during the calendar year, after adjustment for all stock splits and stock dividends). The firm's dividend payout ratio is then defined as common dividends per share divided by the consensus analyst estimate of the earnings per share for the forthcoming calendar year (D/E). Although this definition has the deficiency that it is obviously biased downward — it divides this year's dividend by next year's earnings — it has the advantage that it implicitly uses a "normalized" figure for earnings. We believe that this advantage outweighs the deficiency, especially when one considers the flaws of the apparent alternatives. Furthermore, we have verified that the results are insensitive to reasonable alternative definitions (see footnote 1)

Growth. In comparing historically based and consensus analysts' forecasts, we calculated forty-one different historical growth measures. These included the following: 1) the past growth rate in EPS as determined by a log-linear least squares regression for the latest year,[2] two years, three years, . . ., and ten years; 2) the past growth rate in DPS for the latest year, two years, three years, . . ., and ten years; 3) the past growth rate in book value per share (computed as the ratio of common equity to the outstanding common equity shares) for the latest year, two years, three years, . . ., and ten years; 4) the past growth rate in cash flow per share (computed as the ratio of pretax income, depreciation, and deferred taxes to the outstanding common equity shares) for the latest year, two years, three years, . . ., and ten years; and 5) plowback growth (computed as the firm's retention ratio for the current year times the firm's latest annual return on common equity).

We also used the five-year forecast of earnings per share growth compiled by IBES and reported in mid-January of each year. This number represents the consensus (i.e., mean) forecast produced by analysts from the research departments of leading Wall Street and regional brokerage firms over the preceding three months. IBES selects the contributing brokers "because of the superior quality of their research, professional reputation, and client demand" (IBES *Monthly Summary Book*).

Risk Variables. Although many risk factors could potentially affect the firm's stock price, most of these factors are highly correlated with one another. As shown above in Equation (4), we decided to restrict our attention to four risk measures that have intuitive appeal and are followed by many financial analysts: 1) B, the firm's beta as published by Value Line; 2) Cov, the firm's pretax interest coverage ratio (obtained from Standard & Poor's Compustat); 3) Rsq, the stability of the firm's five-year historical EPS (measured by the R^2 from a log-linear least squares regression); and 4) Sa, the standard deviation of the consensus analysts' five-year EPS growth forecast (mean forecast) as computed by IBES.

After careful analysis of the data used in our study, we felt that we could obtain more meaningful results by imposing six restrictions on the companies included in our study:

1. Because of the need to calculate ten-year historical growth rates, and because we studied three different time periods, 1981, 1982, and 1983, our study requires data for the thirteen-year period 1971-1983. We included only companies with at least a thirteen-year operating history in our study.
2. As our historical growth rate calculations were based on log-linear regressions, and the logarithm of a negative number is not defined, we excluded all companies that experienced negative EPS during any of the years 1971-1983.
3. For similar reasons, we also eliminated companies that did not pay a dividend during any one of the years 1971-1983.
4. To insure comparability of time periods covered by each consensus earnings figure in the P/E ratios, we eliminated all companies that did not have a December 31 fiscal year-end.
5. To eliminate distortions caused by highly unusual events that distort current earnings but not expected future earnings, and thus the firm's price/earnings ratio, we eliminated any firm with a price/earnings ratio greater than 50.
6. As the evaluation of analysts' forecasts is a major part of this study, we eliminated all firms that IBES did not follow.

Our final sample consisted of approximately sixty-five utility firms.[3]

RESULTS

To keep the number of calculations in our study to a reasonable level, we performed the study in two stages. In Stage 1, all forty-one historically oriented approaches for estimating future growth were correlated with each firm's P/E ratio. In Stage 2, the historical growth rate with the highest correlation to the P/E ratio was compared to the consensus analyst growth rate in the multiple regression model described by Equation (4) above. We performed our regressions for each of three recent time periods, because we felt the results of our study might vary over time.

First-Stage Correlation Study

Table 1 gives the results of our first-stage correlation study for each group of companies in each of the years 1981, 1982, and 1983. The values in this table measure the correlation between the historically oriented growth rates for the various time periods and the firm's end-of-year P/E ratio.

The four variables for which historical growth rates were calculated are shown in the left-hand column: EPS indicates historical earnings per share growth, DPS indicates historical dividend per share growth, BVPS indicates historical book value per share growth, and CFPS indicates historical cash flow per share growth. The term "plowback" refers to the product of the firm's retention ratio in the currennt year and its return on book equity for that year. In all, we calculated forty-one historically oriented growth rates for each group of firms in each study period.

The goal of the first-stage correlation analysis was to determine which historically oriented growth rate is most highly correlated with each group's year-end P/E ratio. Eight-year growth in CFPS has the highest correlation with P/E in 1981 and 1982, and ten-year growth in CFPS has the highest correlation with year-end P/E in 1983. In all cases, the plowback estimate of future growth performed poorly, indicating that — contrary to generally held views — plowback is not a factor in investor expectations of future growth.

Second-Stage Regression Study

In the second stage of our regression study, we ran the regression in Equation (4) using two different measures of future growth, g: 1) the best historically oriented growth rate (g_h) from the first-stage correlation study, and 2) the consensus analysts' forecast (g_a) of five-year EPS growth. The regression results, which are shown in Table 2, support at least

TABLE 1

Correlation Coefficients of All Historically Based Growth Estimates by Group and by Year with P/E

Historical Growth Rate Period in Years

Current Year	1	2	3	4	5	6	7	8	9	10
1981										
EPS	−0 02	0 07	0 03	0 01	0 03	0 12	0 08	0 09	0 09	0 09
DPS	0 05	0 18	0 14	0 15	0 14	0 15	0 19	0 23	0 23	0 23
BVPS	0 01	0 11	0 13	0 13	0 16	0 18	0 15	0 15	0 15	0 15
CFPS	−0 05	0.04	0 13	0 22	0 28	0 31	0 30	0 31	−0 57	−0 54
Plowback	0 19									
1982										
EPS	−0 10	−0 13	−0 06	−0 02	−0 02	−0 01	−0 03	−0 03	0 00	0 00
DPS	−0 19	−0 10	0.03	0 05	0 07	0 08	0 09	0 11	0 13	0 13
BVPS	0 07	0 08	0 11	0 11	0 09	0 10	0 11	0 11	0 09	0 09
CFPS	−0 02	−0 08	0 00	0 10	0 16	0 19	0 23	0 25	0 24	0 07
Plowback	0 04									
1983										
EPS	−0 06	−0 25	−0 25	−0 24	−0 16	−0 11	−0 05	0.00	0 02	0 02
DPS	0 03	−0 10	−0 03	0 08	0 15	0 21	0.21	0 21	0 22	0 24
BVPS	0.03	0 10	0 04	0.09	0 15	0 16	0.19	0 21	0 22	0 21
CFPS	−0 08	0 01	0.02	0 08	0 20	0 29	0 35	0 38	0 40	0 42
Plowback	−0 08									

two general conclusions regarding the pricing of equity securities

First, we found overwhelming evidence that the consensus analysts' forecast of future growth is superior to historically oriented growth measures in predicting the firm's stock price. In every case, the R^2 in the regression containing the consensus analysts' forecast is higher than the R^2 in the regression containing the historical growth measure. The regression coefficients in the equation containing the consensus analysts' forecast also are considerably more significant than they are in the alternative regression. These results are consistent with those found by Cragg and Malkiel for data covering the period 1961-1968. Our results also are consistent with the hypothesis that investors use analysts' forecasts, rather than historically oriented growth calculations, in making stock buy-and-sell decisions.

TABLE 2

Regression Results
Model I

Part A: *Historical*

$P/E = a_0 + a_1 D/E + a_2 g_h + a_3 B + a_4 Cov + a_5 Rsq + a_6 Sa$

Year	$\hat{a}_0$	$\hat{a}_1$	$\hat{a}_2$	$\hat{a}_3$	$\hat{a}_4$	$\hat{a}_5$	$\hat{a}_6$	R^2	F Ratio
1981	−6.42*	10 31*	7.67*	3 24	0 54*	1 42*	57 43	0.83	46 49
	(5 50)	(14 79)	(2 20)	(2 86)	(2 50)	(2 85)	(4 07)		
1982	−2 90*	9 32*	8 49*	2 85	0 45*	−0 42	3 63	0 86	65 53
	(2 75)	(18 52)	(4 18)	(2 83)	(2 60)	(0.05)	(0 26)		
1983	−5 96*	10.20*	19 78*	4 85	0.44*	0 33	32 49	0 82	45 26
	(3 70)	(12 20)	(4.83)	(2 95)	(1.89)	(0 50)	(1 29)		

Part B: *Analysis*

$P/E = a_0 + a_1 D/E + a_2 g_a + a_3 B + a_4 Cov + a_5 Rsq + a_6 Sa$

Year	$\hat{a}_0$	$\hat{a}_1$	$\hat{a}_2$	$\hat{a}_3$	$\hat{a}_4$	$\hat{a}_5$	$\hat{a}_6$	R^2	F Ratio
1981	−4 97*	10 62*	54 85*	−0 61	0 33*	0.63*	4 34	0 91	103 10
	(6 23)	(21 57)	(8.56)	(0 68)	(2 28)	(1 74)	(0 37)		
1982	−2 16*	9 47*	50 71*	−1 07	0 36*	−0 31	119 05*	0 90	97 62
	(2 59)	(22.46)	(9 31)	(1 14)	(2.53)	(1.09)	(1 60)		
1983	−8 47*	11.96*	79 05*	2 16	0 56*	0 20	−34 43	0.87	69 81
	(7.07)	(16 48)	(7.84)	(1.55)	(3 08)	(0 38)	(1 44)		

Notes:
* Coefficient is significant at the 5% level (using a one-tailed test) and has the correct sign T-statistic in parentheses

Second, there is some evidence that investors tend to view risk in traditional terms. The interest coverage variable is statistically significant in all but one of our samples, and the stability of the operating income variable is statistically significant in six of the twelve samples we studied. On the other hand, the beta is never statistically significant, and the standard deviation of the analysts' five-year growth forecasts is statistically significant in only two of our twelve samples. This evidence is far from conclusive, however, because, as we demonstrate later, a significant degree of cross-correlation among our four risk variables makes any general inference about risk extremely hazardous.

Possible Misspecification of Risk

The stock valuation theory says nothing about which risk variables are most important to investors. Therefore, we need to consider the possibility that the risk variables of our study are only proxies for the "true" risk variables used by investors. The inclusion of proxy variables may increase the variance of the parameters of most concern, which in this case are the coefficients of the growth variables.[4]

To allow for the possibility that the use of risk proxies has caused us to draw incorrect conclusions concerning the relative importance of analysts' growth forecasts and historical growth extrapolations, we have also estimated Equation (4) with the risk variables excluded. The results of these regressions are shown in Table 3.

Again, there is overwhelming evidence that the consensus analysts' growth forecast is superior to the historically oriented growth measures in predicting the firm's stock price. The R^2 and t-statistics are higher in every case.

CONCLUSION

The relationship between growth expectations and share prices is important in several major areas of finance. The data base of analysts' growth forecasts collected by Lynch, Jones & Ryan provides a unique opportunity to test the hypothesis that investors rely more heavily on analysts' growth forecasts than on historical growth extrapolations in making security buy–and–sell decisions. With the help of this data base, our studies affirm the superiority of analysts' forecasts over simple historical growth extrapolations in the stock price formation process. Indirectly, this finding lends support to the use of valuation models whose input includes expected growth rates.

TABLE 3

Regression Results
Model II

Part A: *Historical*

$P/E = a_0 + a_1 D/E + a_2 g_h$

Year	$\hat{a}_0$	$\hat{a}_1$	$\hat{a}_2$	R^2	F Ratio
1981	−1 05	9 59	21 20	0 73	82 95
	(1 61)	(12 13)	(7 05)		
1982	0 54	8 92	12 18	0 83	167 97
	(1 38)	(17 73)	(6 95)		
1983	−0 75	8 92	12 18	0 77	107 82
	(1 13)	(12 38)	(7 94)		

Part B: *Analysis*

$P/E + a_0 + a_1 D/E + a_2 g_a$

Year	$\hat{a}_0$	$\hat{a}_1$	$\hat{a}_2$	R^2	F Ratio
1981	3 96	10 07	60 53	0 90	274 16
	(8 31)	(8 31)	(20 91)	(15 79)	
1982	−1 75	9 19	44 92	0 88	246 36
	(4 00)	(4 00)	(21 35)	(11 06)	
1983	−4 97	10 95	82 02	0 83	168 28
	(6 93)	(6 93)	(15 93)	(11 02)	

Notes:
* Coefficient is significant at the 5% level (using a one-tailed test) and has the correct sign. T-statistic in parentheses

[1] We also tried several other definitions of "earnings," including the firm's most recent primary earnings per share prior to any extraordinary items or discontinued operations. As our results were insensitive to reasonable alternative definitions of "earnings." we report only the results for the IBES consensus.

[2] For the latest year, we actually employed a point-to-point growth calculation because there were only two available observations.

[3] We use the word "approximately," because the set of available firms varied each year. In any case, the number varied only from zero to three firms on either side of the figures cited here.

[4] See Maddala (1977).

REFERENCES

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Cragg, J. G., and Malkiel, B. G. "The Consensus and Accuracy of Some Predictions of the Growth of Corporate Earnings." *Journal of Finance*. March 1968, pp. 67-84

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Maddala, G. E. *Econometrics*. New York: McGraw-Hill Book Company. 1977

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Item 6 of 312

Witness: Dr. James H. Vander Weide

6. RE: Vander Weide Direct Testimony. With respect to page 19, lines 15-20, please provide a copy of the article written by Dr. Vander Weide from the *Journal of Portfolio Management.*

Response:

A copy of the requested article is provided in response to this Request for Information No. 5. Please refer to electronic file KAW_R_AGDR1#5_061807.pdf (bookmarked as attachment 4).

For electronic version of this response, refer to KAW_R_AGDR1#6_061807.pdf

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Item 7 of 312

Witness: Dr. James H. Vander Weide

7. RE: Vander Weide Direct Testimony. With respect to page 20, lines 20-22 please provide a copy of the updated study by State Street Financial Advisers.

Response:

A copy of the requested article is provided in response to this Request for Information No. 5. Please refer to electronic file KAW_R_AGDR1#5_061807.pdf (bookmarked as attachment 5).

For electronic version of this response, refer to KAW_R_AGDR1#7_061807.pdf

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Item 8 of 312

Witness: Michael Miller

8. RE: Vander Weide Direct Testimony. With respect to page 21, lines 15-23, please provide:

   (a) Estimates of the floatation costs (direct expenses as well as market pressure costs) of the equity issued by KAWC and/or its parent over the past five years, and

   (b) The prospectuses for all equity issues by KAWC and/or its parent over the past five years.

Response:

   (a) None.

   (b) Not applicable.

For electronic version, refer to KAW_R_AGDR1#8_061807.pdf

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Item 9 of 312

Witness: Dr. James H. Vander Weide

9. RE: Vander Weide Direct Testimony. With respect to page 24, lines 7-17, please indicate what water companies were eliminated by each of the screens applied to the companies listed in the Value Line Investment Survey.

<u>Response</u>:

Connecticut Water Services was eliminated because it did not have at least one analyst's long-term growth forecast. No other Value Line water company was eliminated.

For electronic version, refer to KAW_R_AGDR1#9_061807.pdf

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Item 10 of 312

Witness: Dr. James H. Vander Weide

10. RE: Vander Weide Direct Testimony. With respect to page 26, lines 1-2 (Table), please provide copies of the I/B/E/S analyst research reports for the water companies in the proxy group.

<u>Response</u>:

I/B/E/S surveys analysts in the investment community and publishes the average of analysts' growth forecasts for individual companies. I/B/E/S itself does not prepare research reports on individual companies. The average analysts' growth forecast for each of the companies in Dr. Vander Weide's comparable water company group is shown in Exhibit JVW-1, Schedule 1.

For electronic version, refer to KAW_R_AGDR1#10_061807.pdf

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Item 11 of 312

Witness: Dr. James H. Vander Weide

11. RE: Vander Weide Direct Testimony. With respect to page 28, lines 1-10, please provide copies of all studies performed by Dr. Vander Weide which indicates that the LDCs are similar in business and financial risk to:

(a) KAWC, and

(b) The proxy group of water companies.

Response:

(a & b) As Dr. Vander Weide has testified, there are very few publicly-traded water companies that are followed by the investment community. Given the relatively small sample of water companies that are suitable as reasonable proxies for the purposes of estimating KAWC's cost of equity, Dr. Vander Weide believes that the public service commission should consider cost of equity results for additional companies in other regulated industries. From Dr. Vander Weide's experience over the last 30 years as an expert on regulated industries, he believes that the LDCs are the most reasonable companies to include as an additional proxy group to the water company proxy group. The reasons for Dr. Vander Weide's belief that LDCs are similar to KAWC are stated in response to Question 56, page 29, of his direct testimony. Dr. Vander Weide has not conducted quantitative studies that compare the risks of LDCs to water companies. He notes, however, that his DCF results for the LDCs are similar to the DCF results for the water companies.

For electronic version, refer to KAW_R_AGDR1#11_061807.pdf

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Item 12 of 312

Witness: Dr. James H. Vander Weide

12. RE: Vander Weide Direct Testimony. With respect to page 28, lines 11-21, please indicate what gas companies were eliminated by each of the screens applied to the companies listed in the Value Line Investment Survey.

<u>Response</u>:

The following table identifies the Value Line companies that were not included in Dr. Vander Weide's DCF study and the reasons why each company was not included:

Company	*Decrease or No Dividend*	*Fewer than 3 I/B/E/S Growth Estimates (No. of Estimates)*	*Merger*	*Low Safety Rank and/or Bond Rating*
Cascade Nat.Gas		0	Merger with MDU	
Keyspan		1	To be acquired by National Grid	
Laclede Gp.Hldg.		1		
NICOR		1		
(Integrys) Peoples Energy		2	Merger with WPS	
SEMCO Energy	No Dividend			Value Line Safety Rank 4, Below Investment Grade Bond
Southern Union	Resumed Dividend 2006	1		
Southwest Gas		2		
UGI		2		

For electronic version, refer to KAW_R_AGDR1#12_061807.pdf

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Item 13 of 312

Witness: Dr. James H. Vander Weide

13. RE: Vander Weide Direct Testimony. With respect to page 29, lines 14-18 please provide:

    (a) The exact methodology employed by Value Line in developing its 'Safety Rank,'

    (b) How Value Line's 'Safety Rank' compares to other measures of risk employed by Dr. Vander Weide,

    (c) The number and percentage of companies followed by Value Line that have a safety rank of 1, 2, and 3, and

    (d) Copies of all studies known to Dr. Vander Weide that evaluate Value Line's 'Safety Rank.'

Response:

(a) Value Line describes its "Safety Rank" as:

> a measurement of potential risk associated with individual common stocks. The Safety Rank is computed by averaging two other Value Line indexes, the Price Stability Index and the Financial strength Rating. Safety Ranks range from 1 (Highest) to 5 (Lowest). Conservative investors should try to limit their purchases to equities ranked 1 (Highest) and 2 (Above Average) for Safety. [From Value Line Investment Analyzer]

In addition, Value Line states:

> The *Value Line Safety*™ *Rank* measures the total risk of a stock. It is derived from the stock's Index of Price Stability relative to the 1700 other stocks and from the Financial Strength rating of the company. Safety ranks are also given on a scale from 1 (safest) to 5 (riskiest) as follows:
>
> Rank 1 (Highest): This stock is probably one of the safest, most stable, and least risky stock market investments.
>
> Rank 2 (Above Average): This stock is safer and less risky than most.
>
> Rank 3 (Average): This stock is of average risk and safety.
>
> Rank 4 (Below Average): This stock is riskier and less safe than most.

Rank 5 (Lowest): This stock is probably one of the riskiest and least safe. [From *How to Invest in Common Stocks: A Guide to Using the Value Line Investment Survey*]

(b) With the exception of the capital structure data shown on Schedule 9, Dr. Vander Weide did not use other measures of risk.

(c) In the data set contained in The Value Line Investment Analyzer at June 1, 2007, out of 1,667 companies that have a Value Line Safety Rank, 1,403 have a ranking of 1, 2, or 3.

Safety Rank	No. of Companies	% of Total
1	110	7%
2	228	14%
3	1,065	64%
Total No. of Cos.	1,667	

(d) I am aware of Value Line's own study, which provides data on the returns during periods of market declines on stocks which it ranks with a Safety Rank of 1 or 2. The Value Line data indicate that stocks with a Safety Rank of 1 or 2 fall less than the market as a whole when stock prices drop. See Table below, which is reproduced from How to Invest in Common Stocks: A Guide to Using the Value Line Investment Survey:

Results of Safety Ranks in Major Market Declines

Safety Rank	2/11/66-10/7/66	12/13/68-7/2/70	4/14/72-9/11/74	6/17/87-12/4/87	8/26/87-12/4/87	7/13/90-11/2/90	4/22/98-10/08/98	5/22/01-9/21/01	4/16/02-10/9/02
1	-15.6%	-28.6%	-40.5%	-10.5%	-24.7%	-19.0%	-6.1%	-11.5%	-20.8%
2	-18.2	-29.6	-39.9	-16.2	-28.7	-15.5	-14.0	-14.0	-23.8
3	-24.0	-41.1	-47.2	-25.2	-36.0	-24.9	-29.7	-23.4	-33.1
4	-26.5	-57.0	-53.3	-33.6	-40.7	-33.2	-41.7	-41.7	-55.2
5	-29.2	-64.8	-70.0	-31.4	-46.9	-33.1	-37.8	-34.3	-51.7

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Item 14 of 312

Witness: Dr. James H. Vander Weide

14. RE: Vander Weide Direct Testimony. With respect to page 29, lines 21-23, please provide copies of the I/B/E/S analyst research reports for the gas companies in the proxy group.

<u>Response</u>:

I/B/E/S surveys analysts in the investment community and publishes the average analysts' growth forecasts for individual companies. I/B/E/S itself does not prepare research reports on individual companies. The average analysts' growth forecast for each of the companies in Dr. Vander Weide's comparable gas company group is shown in Exhibit JVW-1, Schedule 2.

For electronic version, refer to KAW_R_AGDR1#14_061807.pdf

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Item 15 of 312

Witness: Dr. James H. Vander Weide

15. RE: Vander Weide Direct Testimony. With respect to page 32, lines 8-18, and Schedule 3 of Exhibit __(JVW-1), please provide:

(a) Copies of all work papers used in Dr. Vander Weide's ex ante risk premium study,

(b) An electronic version (Microsoft Excel) of the data used in the analysis, with all data and equations left intact, and

(c) Copies of the regressions run on the data.

Response:

The requested data are supplied with Dr. Vander Weide's work papers that are attached in response to this Request for Information No. 20. Please refer to electronic version KAW_R_AGDR1#20_061807.xls.

For electronic version of this response, refer to KAW_R_AGDR1#15_061807.pdf

KENTUCKY-AMERICAN WATER COMPANY
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Item 16 of 312

Witness: Dr. James H. Vander Weide

16. RE: Vander Weide Direct Testimony. With respect to page 33, line 1 to page 39, line 11, and Schedule 4 of Exhibit __(JVW-1), please provide:

(a) Copies of all work papers used in Dr. Vander Weide's ex post risk premium study using the S&P 500,

(b) The sources of the data items employed,

(c) An electronic version (Microsoft Excel) of the data used in the analysis, with all data and equations left intact, and

(d) Copies of the regressions run on the data.

<u>Response</u>:

The requested data are supplied with Dr. Vander Weide's work papers that are attached in response to this Request for Information No. 20. Please refer to electronic version KAW_R_AGDR1#20_061807.xls.

For electronic version, refer to KAW_R_AGDR1#16_061807.pdf

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Item 17 of 312

Witness: Dr. James H. Vander Weide

17. RE: Vander Weide Direct Testimony. With respect to page 41, line 1 to page 42, line 8, and Schedule 5 of Exhibit __(JVW-1), please provide

(a) All work papers used in Dr. Vander Weide's ex post risk premium study using the S&P Utilities Stock Index,

(b) The sources of the data items employed, and

(c) An electronic version (Microsoft Excel) of the data used in the analysis, with all data and equations left intact.

<u>Response</u>:

The requested data are supplied with Dr. Vander Weide's work papers that are attached in response to this Request for Information No. 20. Please refer to electronic version KAW_R_AGDR1#20_061807.xls.

For electronic version, refer to KAW_R_AGDR1#17_061807.pdf

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ATTORNEY GENERAL'S REQUEST FOR INFORMATION

Item 18 of 312

Witness: Dr. James H. Vander Weide

18. RE: Vander Weide Direct Testimony. With respect to page 42, line 9 to page 43, line 10, and Schedule 8 of Exhibit __(JVW-1), for each company listed in the S&P 500, please provide:

    (a) The number of analysts providing an EPS growth rate forecast as well as the market capitalization weight used for each company,

    (b) The company names and growth rates for those companies with negative expected growth rates,

    (c) The company names, dividend, price, expected growth, cost of equity, and market cap for all companies, including the 25% highest and lowest DCF results, and

    (d) An electronic version (Microsoft Excel) of the data used in the analysis, with all data and equations left intact.

Response:

The requested data are attached. For excel version of S&P 500 data, please refer to KAW_R_AGDR1#18_061807.xls.

For electronic version of this document, refer to KAW_R_AGDR1#18_061807.pdf

KENTUCKY-AMERICAN WATER COMPANY
Attachment to Request for Information No. 18
Part (a)

COMPANY NAME(DS)	EPS LTG #ESTS	Market Cap $ (mils)
3M	7	53,581
ABBOTT LABS	9	81,798
ACE	9	18,107
ADC TELECOM	10	1,823
ADOBE SYSTEMS	7	22,552
ADVANCED MICRO DEVC	9	7,779
AES	3	13,689
AETNA	9	23,078
AFFILIATED CMP SVS 'A'	9	4,712
AFLAC	13	23,098
AGILENT TECHS	4	12,506
AIR PRDS & CHEMS	6	15,781
ALCOA	6	28,434
ALLEGHENY EN	5	7,739
ALLEGHENY TECHS	2	9,899
ALLERGAN	7	16,862
ALLIED WASTE INDS	4	4,549
ALLSTATE	10	36,877
ALLTEL	11	21,578
ALTERA	10	7,331
ALTRIA GROUP INCO	4	174,964
AMAZON.COM	11	15,629
AMBAC FINANCIAL	6	9,006
AMER.ELEC PWR	7	17,749
AMER.STANDARD	8	10,510
AMEREN	5	10,649
AMERICAN EXPRESS	9	66,103
AMERICAN INTL.GP	7	180,785
AMERIPRISE FINL	8	13,673
AMERISOURCEBERGEN	6	9,927
AMGEN	13	72,032
ANADARKO PETROLEUM	5	18,123
ANALOG DEVICES	4	11,797
ANHEUSER-BUSCH COS	7	37,011
AON	7	11,631
APACHE	7	22,244
APARTMENT INV.MAN.'A'	1	5,511
APOLLO GP 'A'	12	7,969
APPLE	10	73,391
APPLERA APPD BIOS	6	5,573

APPLIED MATS	13	25,042
ARCHER-DANLS -MIDL	5	22,030
ARCHSTONE SMITH TST	1	11,972
ASHLAND	#NA	4,152
AT&T	9	227,340
AUTODESK	11	9,219
AUTOMATIC DATA PROC	10	26,788
AUTONATION	6	4,535
AUTOZONE	9	8,660
AVALONBAY COMMNS	2	9,795
AVAYA	10	5,490
AVERY DENNISON	5	7,127
AVON PRODUCTS	7	16,204
BAKER HUGHES	4	20,736
BALL	4	4,695
BANK OF AMERICA	14	224,579
BANK OF NEW YORK CO	13	29,931
BARD C R	6	8,078
BARR PHARMACEUTICALS	7	5,302
BAUSCH & LOMB	3	2,750
BAXTER INTL	4	31,951
BB & T	12	22,541
BEAR STEARNS	7	17,665
BECTON DICKINSON	10	18,313
BED BATH & BEYOND	16	11,208
BEMIS	3	3,448
BEST BUY	19	22,337
BIG LOTS	2	2,636
BIOGEN IDEC	10	14,951
BIOMET	8	10,336
BJ SVS	4	7,759
BLACK & DECKER	5	5,436
BMC SOFTWARE	7	6,111
BOEING	12	68,818
BOSTON PROPS	2	13,672
BOSTON SCIENTIFIC	5	23,569
BRISTOL MYERS SQUIBB	10	53,355
BROADCOM 'A'	11	15,493
BROWN-FORMAN 'B'	3	4,254
BRUNSWICK	8	2,918
BURL NTHN SANTA FE C	6	27,830
CA	7	13,442
CAMPBELL SOUP	11	15,487
CAPITAL ONE FINL	12	23,399
CARDINAL HEALTH	10	27,849
CAREMARK RX	11	26,035
CARNIVAL	8	28,642
CATERPILLAR	4	41,010
CB RICHARD ELLIS GP	3	7,337
CBS 'B'	6	21,249
CELGENE	8	18,080
CENTERPOINT EN	4	5,475
CENTEX	3	5,505
CENTURYTEL	6	5,125
CH ROBINSON WWD	6	8,703
CHARLES SCHWAB	7	22,963
CHESAPEAKE ENERGY	5	13,751
CHEVRON	5	145,601

CHI MERC EX HDG	5	18,808
CHUBB	9	20,846
CIENA	8	2,302
CIGNA	10	14,463
CINCINNATI FIN	2	7,408
CINTAS	9	6,285
CIRCUIT CITY STORES	18	3,107
CISCO SYSTEMS	10	152,813
CIT GP	5	10,789
CITIGROUP	13	245,536
CITIZENS COMMS	7	4,764
CITRIX SYS	10	5,645
CLEAR CHL COMMS	5	17,867
CLOROX	10	9,514
CMS ENERGY	5	3,797
COACH	16	17,642
COCA COLA	7	106,249
COCA COLA ENTS	7	9,586
COGNIZANT TECH SLTN 'A'	12	12,404
COLGATE-PALM	11	34,219
COM BANC	11	6,144
COMCAST 'A'	7	52,213
COMERICA	9	9,443
COMPASS BANCSHARES	7	8,722
COMPUTER SCIS	10	8,893
COMPUWARE	3	3,174
CONAGRA FOODS	6	12,331
CONOCOPHILLIPS	1	106,751
CONSOL EN	4	6,385
CONSOLIDATED EDISON	5	12,347
CONSTELLATION BRANDS 'A'	7	4,104
CONSTELLATION EN	4	14,006
CONVERGYS	9	3,450
COOPER INDS	7	8,269
CORNING	8	31,755
COSTCO WHOLESALE	16	25,217
COUNTRYWIDE FINL	9	22,992
COVENTRY HLTHCR	11	8,661
CSX	4	15,799
CUMMINS	5	7,020
CVS	6	25,613
D R HORTON	7	7,943
DANAHER	12	21,600
DARDEN RESTAURANTS	16	5,777
DEAN FOODS NEW	6	6,291
DEERE	7	23,930
DELL	14	52,656
DEVON ENERGY	5	28,487
DILLARDS 'A'	7	2,469
DOLLAR GENERAL	11	5,124
DOMINION RES	5	30,066
DONNELLEY R R & SONS	4	7,771
DOVER	3	9,632
DOW CHEMICALS	4	40,630
DOW JONES & CO	8	2,231
DTE ENERGY	3	8,300
DU PONT E I DE NEMOURS	6	46,289
DUKE ENERGY	4	24,421

DYNEGY 'A'	1	3,230
E TRADE FINL	5	9,688
EASTMAN CHEMICALS	3	4,817
EASTMAN KODAK	4	6,805
EATON	9	11,880
EBAY	17	42,980
ECOLAB	7	10,395
EDISON INTL	2	15,414
EL PASO	4	9,770
ELECTRONIC ARTS	10	15,223
ELECTRONIC DATA SYSTEMS	3	14,255
ELI LILLY	13	58,582
EMBARQ	3	7,981
EMC	9	29,865
EMERSON ELECTRIC	7	34,133
ENSCO INTL	7	7,430
ENTERGY	4	19,910
EOG RES	6	16,050
EQUIFAX	8	4,721
EQUITY RESD TST PROPS SHBI	#NA	14,300
ESTEE LAUDER COS 'A'	10	5,693
EXELON	4	43,037
EXPRESS SCRIPTS 'A'	12	9,960
EXXON MOBIL	4	408,332
FAMILY DOLLAR STORES	12	4,355
FANNIE MAE	5	53,482
FEDERATED DEPT STRS	8	23,239
FEDERATED INVRS 'B'	8	3,707
FEDEX	7	34,551
FIDELITY NAT INFO SVS	8	12,979
FIFTH THIRD BANCORP	10	22,317
FIRST DATA	12	18,614
FIRST HORIZON NATIONAL	9	5,356
FIRSTENERGY	6	19,679
FISERV	14	8,843
FLUOR	4	7,536
FORD MOTOR	2	13,799
FOREST LABS	16	16,163
FORTUNE BRANDS	6	12,061
FPL GROUP	6	23,455
FRANK RES	8	29,034
FREDDIE MAC	6	43,155
FREEPORT-MCMOR CPR & GD 'B'	2	10,758
GANNETT	7	14,176
GAP	13	14,915
GENERAL DYNAMICS	10	30,534
GENERAL ELECTRIC	11	359,443
GENERAL MILLS	7	19,156
GENERAL MOTORS	1	17,319
GENUINE PARTS	4	8,215
GENWORTH FINANCIAL	9	15,845
GENZYME	7	16,013
GILEAD SCIENCES	10	32,390
GOLDMAN SACHS GP	9	80,491
GOODRICH	10	6,049
GOODYEAR TIRE & RUB	#NA	4,901
GOOGLE 'A'	16	97,995
GRAINGER W W	8	6,518

H & R BLOCK	6	6,946
HALLIBURTON	5	31,151
HARLEY-DAVIDSON	9	16,424
HARMAN INTL INDS	7	6,386
HARRAHS ENTM	9	15,665
HARTFORD FINL SVS GP	8	30,174
HASBRO	4	4,571
HEINZ HJ	7	14,899
HERCULES	1	2,189
HESS	4	14,457
HEWLETT-PACKARD	13	105,214
HILTON HOTELS	10	13,493
HOME DEPOT	13	79,614
HONEYWELL INTL	8	36,725
HOSPIRA	4	6,089
HUDSON CITY BANC	5	7,540
HUMANA	11	9,955
HUNTINGTON BCSH	5	5,353
IAC/INTERACTIVECORP	6	10,158
ILLINOIS TOOL WKS	11	28,444
IMS HEALTH	6	5,571
INGERSOLL-RAND	9	13,115
INTEGRYS ENERGY GROUP	2	4,112
INTEL	15	110,822
INTERNATIONAL BUS MACH	9	136,927
INTERPUBLIC GP	7	5,435
INTL FLAV & FRAG	1	4,132
INTL GAME TECH	8	13,564
INTL PAPER	2	15,947
INTUIT	8	10,153
ITT	3	10,615
JABIL CIRCUIT	8	5,594
JANUS CAPITAL GP	9	4,065
JDS UNIPHASE	4	3,231
JOHNSON & JOHNSON	5	179,288
JOHNSON CONTROLS	5	18,779
JONES APPAREL GROUP	9	3,518
JP MORGAN CHASE & CO	9	167,169
JUNIPER NETWORKS	14	10,410
KB HOME	6	4,412
KELLOGG	10	19,596
KEYCORP	11	15,099
KEYSPAN	1	7,148
KIMBERLY-CLARK	8	30,692
KIMCO REALTY	1	11,810
KINDER MORGAN KANS	2	14,170
KING PHARMS	3	4,483
KLA TENCOR	10	9,968
KOHLS	17	23,304
KROGER	8	17,947
L3 COMMUNICATIONS	8	10,605
LABORATORY CORP OF AM HDG	8	8,572
LEGG MASON	7	13,067
LEGGETT&PLATT	4	4,272
LEHMAN BROS HDG	8	37,931
LENNAR 'A'	7	6,200
LEXMARK INTL GP A	9	5,746
LIMITED BRANDS	16	10,472

LINCOLN NAT	12	18,768
LINEAR TECH	14	9,602
LIZ CLAIBORNE	6	4,509
LOCKHEED MARTIN	9	40,457
LOEWS	#NA	23,415
LOWE'S COMPANIES	16	48,638
LSI LOGIC	2	3,990
M&T BK	6	13,090
MANOR CARE	7	3,862
MARATHON OIL	4	31,370
MARRIOTT INTL 'A'	11	18,447
MARSH & MCLENNAN	6	16,170
MARSHALL & ILSLEY	12	12,123
MASCO	7	11,400
MATTEL	4	10,380
MAXIM INTEGRATED PRDS	13	10,127
MBIA	6	8,955
MCCORMICK & CO NV	7	4,428
MCDONALDS	13	54,009
MCGRAW-HILL	5	22,722
MCKESSON	8	16,143
MEADWESTVACO	1	5,447
MEDCO HEALTH SLTN	14	19,193
MEDIMMUNE	3	7,394
MEDTRONIC	11	56,578
MELLON FINL	12	17,625
MERCK & CO	10	95,937
MEREDITH	4	2,232
MERRILL LYNCH & CO.	7	72,441
METLIFE	10	47,499
MGIC INVT	7	4,786
MICRON TECHNOLOGY	10	8,929
MICROSOFT	16	271,835
MILLIPORE	5	3,834
MOLEX	7	2,831
MOLSON COORS BREWING 'B'	6	5,407
MONSANTO	6	27,675
MONSTER WORLDWIDE	15	5,877
MOODYS	7	18,495
MORGAN STANLEY	9	78,275
MOTOROLA	12	45,062
MURPHY OIL	4	9,501
MYLAN LABORATORIES	5	4,383
NABORS INDS	3	8,727
NAT CITY	7	24,082
NATIONAL OILWELL VARCO	3	12,053
NATIONAL SEMICON	7	7,954
NCR	3	8,135
NETWORK APPLIANCE	12	13,952
NEW YORK TIMES 'A'	6	3,524
NEWELL RUBBERMAID	8	8,413
NEWMONT MINING	2	18,216
NEWS CORP 'A'	3	47,928
NICOR	1	2,036
NIKE 'B'	9	19,535
NISOURCE	6	6,427
NOBLE	4	9,368
NORDSTROM	14	13,471

NORFOLK SOUTHERN	4	18,396
NORTHERN TRUST	14	12,973
NORTHROP GRUMMAN	10	25,152
NOVELL	6	2,187
NOVELLUS SYSTEMS	8	3,858
NUCOR	4	17,746
NVIDIA	9	10,494
OCCIDENTAL PTL	5	38,606
OFFICE DEPOT	11	9,293
OFFICEMAX	5	3,767
OMNICOM GP	11	17,231
ORACLE	17	86,594
PACCAR	7	16,981
PACTIV	4	4,218
PALL	4	4,453
PARKER-HANNIFIN	7	9,731
PATTERSON COMPANIES	7	4,606
PAYCHEX	16	14,924
PEABODY ENERGY	4	10,273
PENNEY JC	10	17,731
PEPSI BOTTLING GP	6	7,283
PEPSICO	8	103,064
PERKINELMER	3	2,834
PFIZER	11	175,685
PG & E	5	16,018
PHELPS DODGE	3	25,120
PINNACLE WEST CAP	3	4,734
PITNEY-BOWES	3	10,348
PLUM CREEK TIMBER	3	6,860
PMC-SIERRA	4	1,336
PNC FINL SVS GP	9	21,522
POLO RALPH LAUREN 'A'	10	5,054
PPG INDUSTRIES	6	10,739
PPL	6	14,442
PRAXAIR	8	19,555
PRINCIPAL FINL GP	9	16,083
PROCTER & GAMBLE	12	199,294
PROGRESS ENERGY	5	12,318
PROGRESSIVE OHIO	6	17,321
PROLOGIS	1	15,846
PRUDENTIAL FINL	9	43,606
PUB SER ENTER GP	3	18,630
PUBLIC STORAGE	1	16,623
PULTE HOMES	4	7,552
QLOGIC	9	2,723
QUALCOMM	10	65,399
QUEST DIAGNOSTICS	9	9,666
QUESTAR	5	7,081
QWEST COMMS INTL	9	16,208
RADIOSHACK	10	3,336
RAYTHEON 'B'	8	23,474
REALOGY	1	7,396
REGIONS FINL NEW	9	25,867
REYNOLDS AMERICAN	4	17,635
ROBERT HALF INTL	8	6,336
ROCKWELL AUTOMATION	6	10,071
ROCKWELL COLLINS	12	11,001
ROHM & HAAS	9	11,321

ROWAN COS	6	3,356
RYDER SYSTEM	5	3,058
SABRE HDG	3	4,327
SAFECO	8	7,618
SAFEWAY	8	15,019
SANDISK	7	8,603
SANMINA-SCI	6	1,892
SARA LEE	6	11,963
SCHERING-PLOUGH	11	34,173
SCHLUMBERGER	5	73,364
SCRIPPS E W 'A'	7	5,694
SEALED AIR	5	5,082
SEARS HOLDINGS	3	27,256
SEMPRA EN	5	15,555
SHERWIN-WILLIAMS	3	8,746
SIGMA ALDRICH	6	5,332
SIMON PR GP	1	24,064
SLM	9	17,241
SMITH INTL	4	8,223
SNAP-ON	3	2,893
SOLECTRON	7	2,803
SOUTHERN	5	26,293
SOUTHWEST AIRLINES	4	11,984
SOVEREIGN BANC	8	11,747
SPECTRA ENERGY	3	15,857
SPRINT NEXTEL	9	55,438
ST JUDE MED	14	13,597
STANLEY WORKS	7	4,504
STAPLES	10	18,391
STARBUCKS	15	22,439
STARWOOD HTLS & RSTS WORLDWIDE	9	13,672
STATE STREET	12	21,727
STRYKER	13	24,837
SUN MICROSYSTEMS	5	21,821
SUNOCO	1	7,750
SUNTRUST BANKS	13	30,222
SUPERVALU	6	7,658
SYMANTEC	14	15,625
SYNOVUS FINL	9	10,448
SYSCO	7	19,744
T ROWE PRICE GP	8	12,164
TARGET	17	52,418
TECO ENERGY	4	3,487
TEKTRONIX	6	2,312
TELLABS	6	4,497
TEMPLE INLAND	2	6,184
TENET HLTHCR	3	3,032
TERADYNE	6	2,938
TEREX	2	6,418
TEXAS INSTS	13	45,644
TEXTRON	8	11,222
THE DIRECTV GROUP	7	27,666
THE HERSHEY COMPANY	10	9,015
THE TRAVELERS COS	7	34,901
THERMO FISHER SCIENTIFIC	2	18,066
TIFFANY & CO	11	5,809
TIME WARNER	8	76,044
TJX COS	7	12,424

TORCHMARK	8	6,262
TRANSOCEAN	3	22,099
TRIBUNE	7	7,218
TXU	4	30,540
TYCO INTL	7	59,455
TYSON FOODS 'A'	4	4,873
UNION PACIFIC	6	26,384
UNISYS	4	2,859
UNITED PARCEL SER	6	46,253
UNITED TECHNOLOGIES	8	64,079
UNITEDHEALTH GP	15	72,980
UNIVISION COMMS 'A'	1	8,985
UNUM GROUP	7	7,264
US BANCORP	10	62,285
US STEEL	3	10,190
UST	3	9,046
V F	9	8,913
VALERO ENERGY	1	34,434
VARIAN MED SYS	6	5,780
VERISIGN	8	5,984
VERIZON COMMS	14	106,504
VIACOM 'B'	12	24,986
VORNADO REALTY TST	1	17,273
VULCAN MATERIALS	3	11,125
WACHOVIA	14	86,602
WAL MART STORES	16	199,273
WALGREEN	11	44,197
WALT DISNEY	12	70,224
WASHINGTON MUTUAL	8	40,247
WASTE MAN	3	17,799
WATERS	4	5,584
WATSON PHARMS	7	2,635
WEATHERFORD INTL	5	13,641
WELLPOINT	12	49,031
WELLS FARGO & CO	16	116,268
WENDY'S INTL	11	3,697
WESTERN UNION	17	16,130
WEYERHAEUSER	3	20,384
WHIRLPOOL	3	6,840
WHOLE FOODS MARKET	9	6,499
WILLIAMS COS	4	15,642
WINDSTREAM	3	6,856
WRIGLEY WILLIAM JR	9	10,772
WYETH	11	65,720
WYNDHAM WORLDWIDE	2	6,889
XCEL ENERGY	5	9,497
XEROX	4	16,294
XILINX	9	8,396
XL CAP 'A'	10	12,584
XTO EN	8	18,399
YAHOO	17	41,266
YUM! BRANDS	12	14,898
ZIMMER HDG	13	19,900
ZIONS BANCORP	12	9,082

KENTUCKY-AMERICAN WATER COMPANY
Attachment to Request for Information No. 18
Part (b)

There is no company in the S&P 500 in the February 2007 I/B/E/S Thomson Financial data that has a negative long-term expected growth rate estimate

KENTUCKY-AMERICAN WATER COMPANY
Attachment to Request for Information No 18
Parts (c) and (d)

COMPANY NAME(DS)	Ticker	Feb-07	Feb-07	Jan-07	Jan-07	Dec-06	Dec-06	P_0	D_0	IBES EPS LTG MEAN	Cost of Equity	Market Cap $ (mils)	1+g	EPS LTG #ESTS
3M	MMM	77 43	73 52	79 88	73 09	81 55	77 35	77 14	1 92	11 21%	14.2%	53.581	111 21%	7
ABBOTT LABS	ABT	55 06	52 06	53.85	48.75	49 10	46 25	50 85	1 30	10 74%	13.8%	81,798	110 74%	9
ACE	ACE	59 96	55 66	61 03	57 40	61 90	55 91	58 64	1 00	12 12%	14 1%	18.107	112 12%	9
ADC TELECOM	ADCT	17 59	15.94	16.65	14 53	15 24	13 40	15 56	0 00	10.85%	10.9%	1.823	110.85%	10
ADOBE SYSTEMS	ADBE	41 10	37 45	41 32	37 20	43 22	37 61	39 65	0 00	14 86%	14 9%	22.552	114 86%	7
ADVANCED MICRO DEVC	AMD	15 91	14 43	20 63	15.52	23 00	19 90	18 23	0 00	14 28%	14.3%	7,779	114 28%	9
AES	AES	23 10	20.50	22 32	19 92	23 85	21 90	21 93	0 00	15 00%	15.0%	13.689	115 00%	3
AETNA	AET	46 60	41 85	43 61	40 31	43 90	41 01	42 88	0 04	15 79%	15.9%	23,078	115 79%	9
AFFILIATED CMP SVS 'A'	ACS	54 50	48.89	49 82	47 79	51 17	48.06	50.04	0 00	12 89%	12 9%	4.712	112 89%	9
AFLAC	AFL	49 37	46.86	48 71	45 50	46.20	43.34	46.66	0 74	14 66%	16 6%	23.098	114.66%	13
AGILENT TECHS	A	34.15	31 24	35.48	31 87	35 69	31 68	33 35	0 00	14.75%	14 8%	12.506	114.75%	4
AIR PRDS & CHEMS	APD	78.63	73.35	75.00	68 58	72 45	68.76	72 80	1 36	11 71%	13 9%	15.781	111 71%	6
ALCOA	AA	36.05	32 07	32 62	28.09	31 33	28 86	31 50	0.68	11 78%	14 3%	28.434	111 78%	6
ALLEGHENY EN	AYE	50.25	45 31	47 94	44 28	46.25	43 55	46 26	0.00	21 40%	21.4%	7.739	121.40%	5
ALLEGHENY TECHS	ATI	110.00	95 79	104 17	85.10	98.72	84 33	96 35	0.52	15.00%	15.7%	9.899	115 00%	2
ALLERGAN	AGN	118 23	110.10	121 22	105.00	123.02	115.01	115.43	0.40	17 29%	17 7%	16.862	117 29%	7
ALLIED WASTE INDS	AW	13 32	11 86	12 88	12 28	13.14	12 22	12 62	0 00	13.50%	13.5%	4.549	113 50%	4
ALLSTATE	ALL	62.44	59.52	65.85	60.05	66 14	62 67	62 78	1 52	9.47%	12 3%	36.877	109 47%	10
ALLTEL	AT	63 88	59.50	63 04	60 00	62 66	56 54	60.94	0 50	7 51%	8.4%	21.578	107 51%	11
ALTERA	ALTR	22 32	19.99	20 65	19 29	20 54	19.30	20.35	0 00	18 70%	18.7%	7.331	118 70%	10
ALTRIA GROUP INCO	MO	87 85	81 17	90 50	86.00	86 56	83.43	85 92	3 44	7 50%	12 1%	174.964	107 50%	4
AMAZON COM	AMZN	42 00	36.68	39 14	36 30	40 64	37 70	38.74	0 00	23 53%	23 5%	15.629	123 53%	11
AMBAC FINANCIAL	ABK	91 83	86.49	90.49	86 11	90.75	84.15	88 30	0 72	11 50%	12 5%	9.006	111 50%	6
AMER ELEC PWR	AEP	46.76	43.48	43.90	41 67	43 13	41 54	43 41	1 56	4 27%	8 3%	17.749	104.27%	7
AMER STANDARD	ASD	55.30	51 52	49.47	45 21	46.80	44 36	48 78	0.72	13.13%	14 9%	10.510	113.13%	8
AMEREN	AEE	55.00	51 62	54 33	52 41	55.08	53 25	53 62	2 54	6 20%	11.6%	10.649	106.20%	5
AMERICAN EXPRESS	AXP	59.15	54 50	61 90	57 14	62 50	58 00	58 87	0.60	12 38%	13.6%	66.103	112 38%	9
AMERICAN INTL GP	AIG	70 19	65 38	72.45	67 94	72 97	69 17	69 68	0.66	12 57%	13 7%	180.785	112 57%	7
AMERIPRISE FINL	AMP	63 08	56 74	59.35	54.68	55.79	53 20	57 14	0.44	10.69%	11.6%	13.673	110.69%	8
AMERISOURCEBERGEN	ABC	55 52	51 95	54 40	45.08	48.02	44 29	49 88	0.20	13.50%	14.0%	9.927	113.50%	6
AMGEN	AMGN	70 49	63 86	76.95	67 85	71 99	67 88	69.84	0 00	16.09%	16.1%	72.032	116 09%	13
ANADARKO PETROLEUM	APC	44 87	39 55	44 17	40 16	50 50	42 01	43.54	0.36	8.80%	9.7%	18.123	108 80%	5
ANALOG DEVICES	ADI	37 17	32 53	34 53	32 28	33 82	32 07	33.73	0 72	20 88%	23.6%	11.797	120 88%	4
ANHEUSER-BUSCH COS	BUD	52 25	48 61	51 56	48.50	49 75	47 39	49.68	1 18	8.63%	11.4%	37,011	108 63%	7
AON	AOC	39 21	35 69	36.20	34 30	37 11	34 87	36.23	0 60	7 86%	9.8%	11.631	107 86%	7
APACHE	APA	72 74	68.00	73 44	63 01	70 50	65 34	68.84	0 60	10 64%	11 7%	22.244	110 64%	7
APARTMENT INV MAN 'A'	AIV	65 79	57 59	63 00	54 14	58 11	54.20	58 81	2 40	4 00%	8 5%	5.511	104 00%	1
APOLLO GP 'A'	APOL	48 85	41 70	43 54	39 02	40 40	37 50	41.84	0.00	15.25%	15 3%	7.969	115.25%	12
APPLE	AAPL	90 81	82 86	97 80	81 90	92 33	76.77	87 08	0.12	20.78%	21.0%	73.391	120 78%	10
APPLERA APPD BIOS	ABI	34 78	30.52	37 59	34 00	38.31	36.20	35 23	0.17	10.50%	11 1%	5,573	110 50%	6
APPLIED MATS	AMAT	19.48	17 72	19.79	17 35	19.33	17.42	18 52	0.20	15.31%	16.6%	25.042	115.31%	13
ARCHER-DANLS.-MIDL	ADM	36.55	32 99	33 00	30.20	35.23	31 20	33.20	0.46	10.40%	12.0%	22.030	110.40%	5
ARCHSTONE SMITH TST	ASN	62 11	55.26	64 77	56 55	60.81	56 01	59 25	1 81	7 00%	10.5%	11.972	107 00%	1
AT&T	T	38.18	35.19	37 88	32 70	36.21	33 74	35.65	1.42	8.27%	12.9%	227.340	108 27%	9
AUTODESK	ADSK	45.07	38 88	45.19	39.81	42 88	39.65	41 91	0.00	16 54%	16.5%	9.219	116 54%	11
AUTOMATIC DATA PROC	ADP	51 50	48 15	49.28	46.85	49 78	47 52	48.85	0 92	12 30%	14.5%	26.788	112 30%	10
AUTONATION	AN	23 19	21 85	22 52	20.65	21 52	20.38	21 69	0.00	11 46%	11 5%	4.535	111 46%	6
AUTOZONE	AZO	132 22	123 17	126 14	115 94	120.37	112 39	121 71	0 00	13 50%	13 5%	8.660	113.50%	9
AVALONBAY COMMNS	AVB	149 94	134 00	149 26	128 26	134 60	125.22	136 88	3.40	7 00%	9 8%	9.795	107 00%	2
AVAYA	AV	13 49	11 96	14 89	12 35	14 25	12 47	13 24	0 00	10.70%	10 7%	5.490	110.70%	10
AVERY DENNISON	AVY	69 16	65 21	71 35	67 08	69 31	66.45	68 09	1 60	11 00%	13 8%	7.127	111 00%	5
AVON PRODUCTS	AVP	40 13	34 29	35 14	32 55	34 25	32 04	34 73	0.74	10.65%	13 2%	16.204	110.65%	7

BAKER HUGHES	BHI	72 55	63.34	74 66	65.55	78.85	71 53	71 08	0.52	18 00%	18.9%	20.736	118.00%	4
BALL	BLL	49 20	45.28	47 55	43.51	44.08	42.40	45 34	0.40	12 50%	13.5%	4.695	112.50%	4
BANK OF AMERICA	BAC	54.21	49.00	54.18	51 35	55.00	51 32	52 51	2 24	8 66%	13.6%	224.579	108.66%	14
BANK OF NEW YORK CO	BK	43.46	39.47	41 39	39 05	40.55	35 13	39 84	0 88	11 31%	13.9%	29.931	111 31%	13
BARD C R	BCR	83 66	79 01	86.17	77 12	85.72	81 74	82 24	0.56	14.80%	15.0%	8.078	114.80%	6
BARR PHARMACEUTICALS	BRL	56 66	52 01	56.15	50.24	52 28	50.03	52 90	0 00	14.66%	14.7%	5.302	114.66%	7
BAUSCH & LOMB	BOL	55 92	51 30	56.10	51 12	53.88	47 36	52 61	0 52	10.67%	11 6%	2.750	110.67%	3
BAXTER INTL.	BAX	50 99	48 10	49 98	46.07	48.54	44 28	47 99	0 67	13.03%	14.7%	31.951	113.03%	4
BB & T	BBT	44 19	42 10	44 30	41 92	44 74	42 74	43 33	1 68	8 53%	13.0%	22.541	108.53%	12
BEAR STEARNS	BSC	170 23	149.10	172 61	160 91	166 20	149.73	161 46	1 28	11 57%	12 5%	17.665	111 57%	7
BECTON DICKINSON	BDX	78 83	74.60	77 30	69 30	73 30	69 98	73 89	0 98	12 45%	14.0%	18,313	112.45%	10
BED BATH & BEYOND	BBBY	43 32	39.87	42 38	37 79	41 72	37 82	40.48	0 00	16.38%	16.4%	11.208	116.38%	16
BEMIS	BMS	34 84	33 00	36 53	32 01	34 99	33.76	34.19	0 84	10.67%	13 6%	3.448	110 67%	3
BEST BUY	BBY	51 80	46 11	51 80	48 01	55 59	46 95	50.04	0 40	16.20%	17 2%	22.337	116 20%	19
BIG LOTS	BIG	27 49	24 13	26 35	22 71	24 11	21 48	24 38	0 00	7 50%	7 5%	2.636	107 50%	2
BIOGEN IDEC	BIIB	50.51	45.02	52 45	47 04	52 72	48.00	49.29	0.00	10 82%	10 8%	14.951	110 82%	10
BIOMET	BMET	42 67	42 15	42 52	41 17	42 50	37 40	41 40	0.30	15 75%	16 6%	10.336	115 75%	8
BJ SVS	BJS	28.65	26.50	29 10	25.55	33.89	28.94	28.77	0.20	23 00%	23 9%	7.759	123 00%	4
BLACK & DECKER	BDK	90.91	83.37	87 39	78.81	87 66	76.85	84.17	1 68	9 60%	11 0%	5.436	109 60%	5
BMC SOFTWARE	BMC	36.92	29 64	35.84	32 25	33.50	31 85	33.33	0.00	12 36%	12.4%	6.111	112 36%	7
BOEING	BA	92 24	85.24	90.34	84.60	91 85	88.35	88 77	1 40	15 56%	17 5%	68.818	115 56%	12
BOSTON PROPS	BXP	133 02	117.00	126 56	109 07	118.22	107 52	118 57	2 72	6 00%	8.6%	13.672	106 00%	2
BOSTON SCIENTIFIC	BSX	18.47	15.85	18.69	16.61	17 35	15.67	17 11	0 00	9 56%	9.6%	23.569	109 56%	5
BRISTOL MYERS SQUIBB	BMY	29 33	25 89	29 39	25.73	26.41	24 60	26.89	1 12	11 58%	16.6%	53.355	111 58%	10
BROADCOM 'A'	BRCM	37 05	31 31	34 70	29 27	35.18	31 39	33 15	0 00	23.14%	23.1%	15.493	123 14%	11
BROWN-FORMAN 'B'	BF B	68 25	64 53	68.14	64 20	69 80	65 27	66 70	1 21	10.40%	12 5%	4.254	110 40%	3
BRUNSWICK	BC	34 86	32.00	34 64	29 67	32 87	31 25	32 55	0.60	9 83%	12.0%	2.918	109 83%	8
BURL NTHN SANTA FE C	BNI	85 90	78 18	81 56	71 51	78 90	71 89	77 99	1 00	14.10%	15.6%	27.830	114.10%	6
CA	CA	27 46	24 50	25 77	22 98	23 35	21 29	24 23	0 16	13.61%	14.4%	13.442	113.61%	7
CAMPBELL SOUP	CPB	42 65	38 50	38 94	37 20	39 98	37 81	39.18	0 80	6.78%	9 1%	15,487	106.78%	11
CAPITAL ONE FINL	COF	83.84	75.78	80 73	75 30	78 74	75.75	78.36	0.11	12 56%	12 7%	23,399	112 56%	12
CARDINAL HEALTH	CAH	73.10	69.50	73 34	63.32	66 99	64 05	68.38	0.36	14 15%	14 8%	27.849	114 15%	10
CAREMARK RX	CMX	64.34	60.20	61 59	54 92	58.08	46.83	57 66	0.40	18 54%	19 4%	26,035	118 54%	11
CARNIVAL	CCL	52 41	45.75	52.73	49.69	50.31	46.81	49 62	1 10	14 63%	17 3%	28.642	114.63%	8
CATERPILLAR	CAT	68.43	63.01	64 34	57 98	63.95	60 30	63 00	1 20	13 47%	15.8%	41.010	113 47%	4
CB RICHARD ELLIS GP	CBG	39 15	32 00	37 84	32 50	34.26	31 74	34 58	0 00	11 33%	11 3%	7.337	111 33%	3
CBS 'B'	CBS	32 27	28.45	31 97	30.50	32 04	29.45	30 78	0 88	10.02%	13.4%	21,249	110.02%	6
CELGENE	CELG	57.41	52 30	58.60	52 69	60.12	53 50	55.77	0.00	50.81%	50.8%	18.080	150.81%	8
CENTERPOINT EN	CNP	18 95	17 25	17 54	16.40	16.87	16 02	17 17	0 68	11 00%	15.7%	5.475	111 00%	4
CENTEX	CTX	55.62	45 94	56.45	50 56	58.42	54 38	53.56	0 16	13.33%	13 7%	5.505	113.33%	3
CENTURYTEL	CTL	46.80	44 30	44 99	42.66	44.11	41 99	44 14	0 26	3.50%	4 1%	5.125	103.50%	6
CH ROBINSON WWD	CHRW	54 67	50 26	53 50	42 11	44.40	39.44	47 40	0.72	16 17%	18.0%	8.703	116.17%	6
CHARLES SCHWAB	SCHW	19 97	17 95	20.86	17 99	19.49	17 78	19.01	0.20	15 26%	16 5%	22.963	115.26%	7
CHESAPEAKE ENERGY	CHK	31 83	28 88	30 11	27 27	34 16	29.00	30.21	0.24	15 00%	16.0%	13,751	115.00%	5
CHEVRON	CVX	74 96	68.02	73.44	68 48	76 20	71 83	72 16	2 08	5.16%	8 4%	145.601	105 16%	5
CHI MERC EX HDG	CME	587 66	510.00	596.30	515.96	550.33	503.05	543 88	3.44	22 23%	23.0%	18.808	122 23%	5
CHUBB	CB	53.60	50.60	53 86	51 57	53 68	51 01	52 39	1 16	9 82%	12.4%	20.846	109.82%	9
CIENA	CIEN	32 80	26.08	30.56	27 08	29.73	24 39	28.44	0 00	10 88%	10.9%	2.302	110 88%	8
CIGNA	CI	146 70	131 99	132 99	127 00	132 65	124 12	132 58	0 10	11 94%	12.0%	14.463	111 94%	10
CINCINNATI FIN	CINF	46.24	42 99	46.00	44.49	46.89	43 80	45.07	1.42	10.50%	14.2%	7.408	110 50%	2
CINTAS	CTAS	42 89	40.16	42 05	39 68	43.24	38.48	41.08	0 39	13.89%	15.0%	6.285	113 89%	9
CIRCUIT CITY STORES	CC	22 02	18.99	20.90	18.95	25.52	18 25	20 77	0 16	16.45%	17.4%	3,107	116 45%	18
CISCO SYSTEMS	CSCO	28.85	25 44	28.99	25.76	27 96	26.45	27 24	0.00	14 63%	14.6%	152.813	114 63%	10
CIT GP	CIT	61 59	54 92	59.23	54 12	56.66	51 21	56 29	1.00	7 75%	9.6%	10.789	107 75%	5
CITIGROUP	C	55 50	49 56	56.28	53 50	57 00	48 83	53.45	2 16	9 81%	14 6%	245.536	109.81%	13
CITIZENS COMMS	CZN	15 21	14.01	14 69	13 92	14.49	13 95	14 38	1 00	4 04%	11 9%	4.764	104.04%	7
CITRIX SYS	CTXS	33 30	30.86	32 99	26 10	29 75	26.62	29 94	0.00	14 60%	14 6%	5.645	114.60%	10
CLEAR CHL COMMS	CCU	37 14	35.61	37 55	35 31	35 78	35.16	36.09	0.75	12 01%	14 5%	17.867	112 01%	5
CLOROX	CLX	67 50	62 50	66 20	62 84	64 90	63.21	64 53	1 24	10 30%	12.5%	9.514	110.30%	10
CMS ENERGY	CMS	18.41	16 63	16.88	15 98	17 00	15.93	16.81	0.20	6.60%	7 9%	3.797	106.60%	5
COACH	COH	51 03	42 47	47.03	42 51	44 99	41 85	44 98	0.00	20 69%	20 7%	17.642	120 69%	16
COCA COLA	KO	48 55	45 56	49.00	47 49	49 35	46.23	47 70	1 36	8.47%	11.8%	106.249	108 47%	7
COCA COLA ENTS	CCE	21 25	20.05	21 22	20.12	21 03	19 97	20 61	0 24	8.69%	10.0%	9.586	108 69%	7
COGNIZANT TECH SLTN 'A'	CTSH	95 55	84 67	85.37	75.75	82 49	75 27	83 18	0 00	34.92%	34 9%	12.404	134 92%	12
COLGATE-PALM	CL	69.00	66.67	68.56	65.01	66.48	64 16	66.65	1 28	10.23%	12 5%	34.219	110.23%	11
COM.BANC	CBH	35.01	33.00	36.15	30.45	36.66	34 25	34.25	0 52	13.73%	15.0%	6.144	113.73%	11
COMCAST 'A'	CMCSA	29 46	24.92	30.18	27 89	28.94	26 83	28.04	0 00	18.47%	18 5%	52.213	118.47%	7
COMERICA	CMA	63.39	59.21	59 97	57 68	59 72	57 55	59.59	2 56	6.86%	11 8%	9.443	106.86%	9
COMPASS BANCSHARES	CBSS	70.74	60 74	61 08	58 61	60.88	56.81	61 48	1 72	10 14%	13 4%	8,722	110 14%	7
COMPUTER SCIS	CSC	56.25	52 02	53.20	50 75	54 13	51 37	52 95	0.00	10 75%	10.8%	8,893	110 75%	10

COMPUWARE	CPWR	9.68	8.92	9 03	8.28	8 75	8 29	8.83	0.00	11 00%	11.0%	3.174	111 00%	3
CONAGRA FOODS	CAG	26.40	24 89	27 73	25 63	28.35	25.27	26 38	0 72	7 17%	10 3%	12.331	107 17%	6
CONOCOPHILLIPS	COP	68.44	64 01	71 50	61 59	74.89	66.05	67 75	1 64	7 00%	9 8%	106.751	107 00%	1
CONSOL EN	CNX	38 06	33 96	35.00	29 15	37 72	31 88	34 30	0 28	16.93%	17 9%	6.385	116 93%	4
CONSOLIDATED EDISON	ED	50 05	48 00	48 70	47 07	49 28	47 55	48 44	2 32	2 96%	8 2%	12.347	102 96%	5
CONSTELLATION BRANDS 'A'	STZ	24.89	23 01	29 17	24.07	29 14	27 79	26 35	0.00	11 75%	11.8%	4,104	111 75%	7
CONSTELLATION EN	CEG	83 16	72 55	72 65	68.78	70 20	67 70	72 51	1 74	12 50%	15.4%	14.006	112 50%	4
CONVERGYS	CVG	27 18	25.38	26 50	23.84	24 32	23.45	25.11	0.00	11.44%	11 4%	3.450	111 44%	9
COOPER INDS.	CBE	96 23	89.74	95.66	88.32	94.49	88 28	92 12	1 68	12.43%	14.6%	8.269	112 43%	7
CORNING	GLW	22 80	19.56	21 73	18.12	22 34	18.62	20.53	0.00	17 50%	17.5%	31.755	117 50%	8
COSTCO WHOLESALE	COST	58 70	55.05	57 25	52 43	55 12	51 73	55.05	0.52	12 99%	14 1%	25,217	112 99%	16
COUNTRYWIDE FINL	CFC	45 19	36.93	45 26	39.86	43 10	39 21	41 59	0.60	10 83%	12.5%	22.992	110.83%	9
COVENTRY HLTHCR.	CVH	56.87	51 20	52 20	48.78	51 85	48 28	51 53	0.00	13 55%	13.6%	8,661	113.55%	11
CSX	CSX	42 53	36.63	37 00	33.50	37 89	33 55	36.85	0.48	16 86%	18 5%	15.799	116.86%	4
CUMMINS	CMI	146.80	133 02	135.00	112 64	124.27	117 55	128 21	1.44	12 56%	13.9%	7,020	112 56%	5
CVS	CVS	33.58	30.76	33.72	30.46	31 83	28 47	31.47	0 19	13.95%	14 7%	25.613	113 95%	6
D R HORTON	DHI	31 13	25 05	29.38	25 05	27 81	25 71	27 36	0 60	13.29%	15.9%	7.943	113.29%	7
DANAHER	DHR	75.00	70.04	75.97	70.47	74 40	71 37	72.88	0 08	14 89%	15 0%	21.600	114 89%	12
DARDEN RESTAURANTS	DRI	43.23	38 98	40.68	38 15	41 62	39.51	40 36	0.46	12 05%	13 4%	5.777	112 05%	16
DEAN FOODS NEW	DF	46.39	42 91	44.78	40 95	43.55	42 23	43 47	0 00	10.04%	10.0%	6.291	110 04%	6
DEERE	DE	116 50	100.44	100 95	90.23	98.51	93.55	100.03	1 76	9.67%	11 7%	23,930	109 67%	7
DELL	DELL	25 51	22 51	27.48	23 57	27 58	25.04	25.28	0.00	12 38%	12.4%	52.656	112 38%	14
DEVON ENERGY	DVN	71 24	64 78	70 91	63 24	74.49	66.23	68 48	0.45	11 19%	12.0%	28,487	111 19%	5
DILLARDS 'A'	DDS	36 10	32 90	35 78	32 78	36 15	33.89	34.60	0.16	6.00%	6.5%	2.469	106 00%	7
DOLLAR GENERAL	DG	18 01	16.38	17.88	16.16	16 17	15 01	16.60	0.20	12 12%	13.5%	5.124	112 12%	11
DOMINION RES	D	88 30	82 97	84.00	79.67	84 30	80 39	83.27	2 84	7 30%	11.2%	30.066	107 30%	5
DONNELLEY R R & SONS	RRD	38.71	35.40	37 48	35.22	36.00	34 93	36.29	1 04	10 00%	13.4%	7.771	110.00%	4
DOVER	DOV	50.92	47 13	50 00	47 12	50 40	48 29	48.98	0 74	12 67%	14.5%	9.632	112 67%	3
DOW CHEMICALS	DOW	47 26	41 10	42 68	39.02	40.65	39 45	41 69	1 50	9.80%	14.0%	40.630	109 80%	4
DOW JONES & CO	DJ	38.34	35.43	40.08	36.61	39.20	35 60	37 54	1 00	13.66%	16.9%	2.231	113.66%	8
DTE ENERGY	DTE	48.69	46.03	49.42	45 14	49.24	46 98	47 58	2 12	5 67%	10 7%	8,300	105.67%	3
DU PONT E I DE NEMOURS	DD	53 67	48 63	51 00	47 58	49.68	45.90	49.41	1 48	8 01%	11 5%	46.289	108.01%	6
DUKE ENERGY	DUK	20.43	19 43	20.00	18 40	20.09	18.30	19.44	0 84	5.25%	10 1%	24,421	105 25%	4
DYNEGY 'A'	DYN	8.81	6 95	7 25	6.47	7 32	6 59	7 23	0 00	4.00%	4.0%	3,230	104 00%	1
E TRADE FINL	ETFC	24 89	22 25	26 08	22 50	24 09	22 18	23.67	0.00	14 30%	14 3%	9.688	114 30%	5
EASTMAN CHEMICALS	EMN	61 83	57 60	63 22	57 54	60 00	57 73	59.65	1 76	6.67%	10.0%	4.817	106 67%	3
EASTMAN KODAK	EK	27 08	23.74	26 50	24 38	26 54	25.13	25.56	0.50	4 75%	6.9%	6.805	104.75%	4
EATON	ETN	84.89	76.78	78 58	71 91	78 84	74 32	77 55	1 72	10 87%	13.5%	11.880	110.87%	9
EBAY	EBAY	34 35	30 88	33 80	28.60	33 22	30 02	31 81	0 00	22 25%	22 3%	42.980	122 25%	17
ECOLAB	ECL	44.91	41 62	45 37	42 77	45 78	43 81	44 04	0.46	17 52%	18 6%	10.395	117 52%	7
EDISON INTL	EIX	51 00	45 00	46.28	42 76	47 15	44 79	46 16	1 16	6 50%	9.3%	15.414	106.50%	2
EL PASO	EP	15.66	14 23	15.63	14 26	15 84	14 40	15.00	0 16	12 00%	13 3%	9.770	112 00%	4
ELECTRONIC ARTS	ERTS	54 39	49 14	54.43	47 96	56.68	50.21	52 14	0 00	18.69%	18 7%	15.223	118.69%	10
ELECTRONIC DATA SYSTEMS	EDS	29 94	25 96	27 74	25 75	27 93	26.33	27 28	0.20	21 33%	22.3%	14.255	121 33%	3
ELI LILLY	LLY	55 20	52 30	54 37	51 57	54.92	51 13	53 25	1 70	8.24%	11 9%	58,582	108 24%	13
EMBARQ	EQ	57 56	51 94	57 00	51 62	53.32	49.90	53 56	2 00	3.33%	7 5%	7.981	103 33%	3
EMC	EMC	14.89	13.47	14 54	13 07	13 79	12 86	13.77	0.00	14.49%	14.5%	29.865	114 49%	9
EMERSON ELECTRIC	EMR	46.08	42 73	45 20	43.11	44 65	41 95	43.95	1 05	10 43%	13.2%	34.133	110.43%	7
ENSCO INTL	ESV	52 93	48.52	51 19	45.00	55 75	49.83	50.54	0 10	34 00%	34 3%	7.430	134 00%	7
ENTERGY	ETR	105.20	92 45	94 16	89.60	94 03	90 50	94.32	2 16	8 25%	10.9%	19.910	108.25%	4
EOG RES	EOG	69.95	64 40	69 75	59.21	70 72	61 87	65.98	0 36	9 84%	10.5%	16.050	109 84%	6
EQUIFAX	EFX	42 00	37 46	41 64	39.37	41 64	37 73	39 97	0 16	10.63%	11 1%	4.721	110 63%	8
ESTEE LAUDER COS 'A'	EL	48.73	45.60	48 15	39.52	42 15	40 28	44 07	0 50	11 44%	12 6%	5.693	111 44%	10
EXELON	EXC	72 31	59 93	62 99	58.74	62 82	60 82	62 94	1 76	8 75%	12 0%	43.037	108 75%	4
EXPRESS SCRIPTS 'A'	ESRX	79.58	69 25	72 03	64 64	75.00	65.99	71 08	0 00	17 08%	17 1%	9.960	117 08%	12
EXXON MOBIL	XOM	76.10	71 18	76.27	70 64	79.00	74 82	74 67	1 28	6.15%	8 1%	408,332	106 15%	4
FAMILY DOLLAR STORES	FDO	33.31	28 76	32 74	28 59	29 99	27 77	30 19	0.46	11 75%	13.6%	4.355	111 75%	12
FANNIE MAE	FNM	60 25	55.85	60.44	54 97	61 50	56.34	58 23	1 60	9.22%	12.4%	53,482	109 22%	5
FEDERATED DEPT STRS	FD	45.00	40.88	41 61	36 12	41 60	37 39	40.43	0.51	12 16%	13.7%	23,239	112 16%	8
FEDERATED INVRS 'B'	FII	38.40	35 02	36.90	33 37	34 20	32 44	35.06	0 72	11 25%	13.7%	3.707	111 25%	8
FEDEX	FDX	121 42	110.30	112 90	106.63	117 74	106 69	112 61	0.36	13 54%	13.9%	34.551	113 54%	7
FIDELITY NAT INFO SVS.	FIS	47 75	42 42	42 60	39.99	41 87	39 35	42 33	0.20	12 88%	13.4%	12.979	112 88%	8
FIFTH THIRD BANCORP	FITB	41 30	39.57	41.41	38.86	41 57	39 14	40 31	1 60	10 45%	15.1%	22.317	110.45%	10
FIRST DATA	FDC	25 96	24.19	26 50	24.34	25 74	23 29	25 00	0 12	11 67%	12.2%	18.614	111 67%	12
FIRST HORIZON NATIONAL	FHN	45.44	42 49	44 05	39.75	42 00	39 61	42 22	1 80	7 33%	12 2%	5.356	107 33%	9
FIRSTENERGY	FE	66.29	59 36	61 23	57 77	61 70	59 87	61.04	2 00	7 50%	11 3%	19.679	107 50%	6
FISERV	FISV	55.08	51 93	53 87	51 11	53.60	50.24	52 64	0 00	14 21%	14 2%	8.843	114 21%	14
FLUOR	FLR	90.00	83 00	82 81	75.22	88.01	80.88	83 32	0.80	23.33%	24.6%	7.536	123 33%	4
FORD MOTOR	F	8 97	7 60	8 62	7 43	8 15	6 85	7 94	0.00	8.98%	9.0%	13.799	108 98%	2
FOREST LABS	FRX	57 97	51 16	56.54	50.00	52 13	48.82	52 77	0.00	15 39%	15.4%	16,163	115 39%	16

FORTUNE BRANDS	FO	84.21	78.95	86.90	79.50	85.96	79.97	82.58	1.56	10.56%	12.8%	12.061	110.56%	6
FPL GROUP	FPL	63.07	56.67	56.87	53.72	55.57	53.04	56.49	1.64	8.40%	11.8%	23,455	108.40%	6
FRANK RES.	BEN	126.71	115.16	121.77	111.31	114.70	104.49	115.69	0.60	14.87%	15.5%	29.034	114.87%	8
FREDDIE MAC	FRE	66.97	62.82	68.55	63.71	69.85	66.30	66.37	2.00	9.64%	13.2%	43.155	109.64%	6
FREEPORT-MCMOR.CPR & GD 'I	FCX	61.99	52.65	58.56	48.85	62.89	53.40	56.39	1.25	13.50%	16.2%	10.758	113.50%	2
GANNETT	GCI	63.50	57.92	60.94	57.46	61.46	59.28	60.09	1.24	8.26%	10.6%	14.176	108.26%	7
GAP	GPS	20.26	18.21	21.04	18.50	20.70	18.56	19.55	0.32	10.63%	12.5%	14.915	110.63%	13
GENERAL DYNAMICS	GD	80.48	74.25	81.28	73.59	75.97	72.36	76.32	0.92	10.13%	11.5%	30.534	110.13%	10
GENERAL ELECTRIC	GE	36.60	34.50	38.28	35.76	38.49	34.96	36.43	1.12	10.67%	14.3%	359.443	110.67%	11
GENERAL MILLS	GIS	58.33	54.57	57.98	56.08	59.23	55.79	57.00	1.48	8.13%	11.1%	19.156	108.13%	7
GENERAL MOTORS	GM	37.24	31.31	33.33	29.10	31.13	28.81	31.82	1.00	6.03%	9.6%	17.319	106.03%	1
GENUINE PARTS	GPC	50.75	47.46	48.60	46.19	48.34	46.29	47.94	1.46	9.63%	13.2%	8.215	109.63%	4
GENWORTH FINANCIAL	GNW	37.16	34.70	35.27	33.69	35.01	32.18	34.67	0.36	10.36%	11.6%	15,845	110.36%	9
GENZYME	GENZ	67.84	60.78	68.77	60.53	64.35	59.71	63.66	0.00	17.36%	17.4%	16,013	117.36%	7
GILEAD SCIENCES	GILD	74.97	69.51	66.98	61.92	68.23	63.11	67.45	0.00	17.91%	17.9%	32,390	117.91%	10
GOLDMAN SACHS GP	GS	222.75	194.65	220.51	197.82	206.70	191.52	205.66	1.40	15.53%	16.4%	80.491	115.53%	9
GOODRICH	GR	52.00	46.65	49.16	44.97	46.48	44.29	47.26	0.80	14.77%	16.8%	6,049	114.77%	10
GOOGLE 'A'	GOOG	506.01	443.04	513.00	461.11	492.40	452.34	477.98	0.00	36.54%	36.5%	97.995	136.54%	16
GRAINGER W W	GWW	80.37	76.28	77.87	68.77	74.42	69.68	74.57	1.16	12.21%	14.1%	6.518	112.21%	8
H & R BLOCK	HRB	24.95	21.54	24.86	22.86	24.05	22.69	23.49	0.54	13.67%	16.4%	6,946	113.67%	6
HALLIBURTON	HAL	32.30	29.35	30.90	27.65	33.78	30.80	30.80	0.30	18.00%	19.2%	31.151	118.00%	5
HARLEY-DAVIDSON	HOG	70.32	65.23	74.03	68.26	74.74	67.64	70.04	0.84	12.89%	14.3%	16.424	112.89%	9
HARMAN INTL INDS.	HAR	105.68	94.53	104.52	92.40	107.90	98.53	100.59	0.05	21.13%	21.2%	6.386	121.13%	7
HARRAHS ENTM	HET	85.55	83.75	85.58	82.31	84.25	77.52	83.16	1.60	13.66%	16.0%	15,665	113.66%	9
HARTFORD FINL SVS GP	HIG	97.95	92.55	95.04	90.30	93.75	83.78	92.23	2.00	10.72%	13.3%	30.174	110.72%	8
HASBRO	HAS	29.80	27.61	28.94	27.04	27.69	26.14	27.87	0.64	10.50%	13.2%	4,571	110.50%	4
HEINZ HJ	HNZ	47.95	45.51	47.16	44.90	46.75	44.13	46.07	1.40	7.34%	10.8%	14.899	107.34%	7
HERCULES	HPC	21.40	19.58	20.09	18.28	19.73	18.11	19.53	0.00	10.00%	10.0%	2.189	110.00%	1
HESS	HES	56.60	52.03	54.86	45.96	52.70	48.40	51.76	0.40	9.07%	10.0%	14.457	109.07%	4
HEWLETT-PACKARD	HPQ	43.24	38.47	43.72	41.05	41.70	39.21	41.23	0.32	12.88%	13.8%	105.214	112.88%	13
HILTON HOTELS	HLT	37.82	34.11	36.49	33.15	35.79	32.37	34.96	0.16	13.49%	14.0%	13.493	113.49%	10
HOME DEPOT	HD	42.01	39.29	41.84	39.06	40.37	38.18	40.13	0.90	12.61%	15.3%	79.614	112.61%	13
HONEYWELL INTL.	HON	48.50	45.51	45.99	43.14	45.77	41.49	45.07	1.00	11.13%	13.7%	36.725	111.13%	8
HOSPIRA	HSP	40.66	35.30	37.13	33.60	34.76	32.58	35.67	0.00	10.75%	10.8%	6.089	110.75%	4
HUDSON CITY BANC	HCBK	14.00	13.18	14.25	13.59	14.09	13.08	13.70	0.32	17.00%	19.9%	7.540	117.00%	5
HUMANA	HUM	64.50	55.17	56.68	51.00	56.93	52.85	56.19	0.00	18.54%	18.5%	9,955	118.54%	11
HUNTINGTON BCSH	HBAN	24.10	23.04	24.14	22.84	24.97	22.87	23.66	1.06	5.80%	10.9%	5.353	105.80%	5
IAC/INTERACTIVECORP	IACI	40.99	37.70	39.48	36.87	38.66	35.49	38.20	0.00	12.46%	12.5%	10.158	112.46%	6
ILLINOIS TOOL WKS	ITW	53.65	50.82	51.20	45.60	48.09	45.93	49.22	0.84	12.68%	14.7%	28.444	112.68%	11
IMS HEALTH	RX	30.07	28.05	28.86	26.26	27.98	26.97	28.03	0.12	12.45%	13.0%	5,571	112.45%	6
INGERSOLL-RAND	IR	45.62	41.10	43.89	38.25	41.60	37.83	41.38	0.72	11.96%	14.0%	13.115	111.96%	9
INTEGRYS ENERGY GROUP	TEG	58.04	53.05	55.47	52.72	54.83	51.87	54.33	2.64	5.00%	10.5%	4.112	105.00%	2
INTEL	INTC	21.67	19.80	22.30	20.14	21.45	20.03	20.90	0.45	12.58%	15.2%	110.822	112.58%	15
INTERNATIONAL BUS MACH	IBM	100.44	92.47	100.90	94.55	97.88	90.55	96.13	1.20	10.56%	12.0%	136,927	110.56%	9
INTERPUBLIC GP	IPG	13.34	12.38	13.94	12.08	12.83	11.43	12.67	0.00	9.95%	9.9%	5.435	109.95%	7
INTL FLAV & FRAG	IFF	49.46	46.29	51.00	47.27	49.88	46.92	48.47	0.84	10.00%	12.0%	4.132	110.00%	1
INTL GAME TECH	IGT	44.80	39.52	48.79	41.68	46.76	43.40	44.16	0.52	15.19%	16.6%	13,564	115.19%	8
INTL PAPER	IP	38.00	33.59	34.86	32.75	35.25	32.90	34.56	1.00	6.00%	9.3%	15,947	106.00%	2
INTUIT	INTU	32.10	28.93	32.23	28.54	32.11	29.90	30.64	0.00	15.25%	15.3%	10.153	115.25%	8
ITT	ITT	61.71	58.10	60.26	56.30	57.44	52.50	57.72	0.56	12.33%	13.5%	10.615	112.33%	3
JABIL CIRCUIT	JBL	27.86	23.95	25.51	23.45	29.48	23.40	25.61	0.28	23.97%	25.4%	5.594	123.97%	8
JANUS CAPITAL GP	JNS	22.40	20.58	22.60	20.04	21.80	19.96	21.23	0.04	17.96%	18.2%	4,065	117.96%	9
JDS UNIPHASE	JDSU	17.50	15.50	17.99	15.69	18.65	16.61	16.99	0.00	18.75%	18.8%	3,231	118.75%	4
JOHNSON & JOHNSON	JNJ	67.15	62.72	68.22	65.90	67.25	65.29	66.09	1.50	8.46%	11.1%	179.288	108.46%	5
JOHNSON CONTROLS	JCI	99.67	91.30	94.13	84.28	88.44	81.09	89.82	1.32	14.00%	15.6%	18.779	114.00%	5
JONES APPAREL GROUP	JNY	34.31	32.30	35.54	32.70	34.51	32.94	33.72	0.56	9.67%	11.6%	3.518	109.67%	9
JP MORGAN CHASE & CO	JPM	51.95	47.60	51.16	47.32	49.00	45.51	48.76	1.36	10.36%	13.6%	167.169	110.36%	9
JUNIPER NETWORKS	JNPR	20.19	17.85	20.92	17.84	21.78	18.40	19.50	0.00	17.62%	17.6%	10.410	117.62%	14
KB HOME	KBH	56.08	48.65	54.41	47.69	53.70	49.61	51.69	1.00	12.00%	14.3%	4.412	112.00%	6
KELLOGG	K	50.42	48.68	51.00	48.95	50.95	49.33	49.89	1.16	8.98%	11.7%	19.596	108.98%	10
KEYCORP	KEY	39.90	37.42	38.30	37.00	38.63	35.73	37.83	1.46	6.91%	11.3%	15.099	106.91%	11
KEYSPAN	KSE	41.36	40.80	41.52	40.62	41.36	40.79	41.08	1.90	2.50%	7.6%	7.148	102.50%	1
KIMBERLY-CLARK	KMB	70.28	67.25	69.97	67.66	68.58	65.90	68.27	2.12	7.21%	10.8%	30.692	107.21%	8
KIMCO REALTY	KIM	53.60	48.93	49.93	43.59	47.13	44.20	47.90	1.44	8.00%	11.5%	11.810	108.00%	1
KINDER MORGAN KANS	KMI	106.50	105.58	107.02	105.00	106.20	104.96	105.88	3.50	10.00%	13.9%	14.170	110.00%	2
KING PHARMS	KG	18.95	17.50	18.13	15.79	16.92	15.86	17.19	0.00	5.73%	5.7%	4.483	105.73%	3
KLA TENCOR	KLAC	54.66	48.30	52.84	46.85	52.40	49.26	50.72	0.48	17.33%	18.5%	9.968	117.33%	10
KOHLS	KSS	74.63	68.31	71.10	65.84	72.49	67.66	70.01	0.00	17.67%	17.7%	23,304	117.67%	17
KROGER	KR	26.69	24.78	25.73	22.94	24.48	21.41	24.34	0.26	8.92%	10.1%	17.947	108.92%	8
L3 COMMUNICATIONS	LLL	89.42	82.75	83.25	79.26	84.49	78.00	82.86	1.00	14.34%	15.8%	10.605	114.34%	8

LABORATORY CORP OF AM HD(	LH	81.00	72 71	74.85	70 94	74 30	70 26	74 01	0.00	13 13%	13.1%	8,572	113.13%	8
LEGG MASON	LM	110.17	100.55	109 68	95 63	98 75	93 83	101 44	0.84	13 50%	14.5%	13.067	113.50%	7
LEGGETT&PLATT	LEG	24 71	23 59	24 67	23 07	24 46	23 11	23 94	0.68	14 50%	18.0%	4.272	114.50%	4
LEHMAN BROS HDG.	LEH	86 18	72 80	84 13	76.20	78 88	72 26	78 41	0 60	12 63%	13.5%	37.931	112 63%	8
LENNAR 'A'	LEN	56 54	48 76	54.62	48.33	54.61	50.57	52 24	0 64	11 21%	12.7%	6.200	111 21%	7
LEXMARK INTL GP A	LXK	64 51	59 24	73.20	61 57	74 68	68.49	66 95	0 00	9 18%	9.2%	5.746	109 18%	9
LIMITED BRANDS	LTD	29.88	27 22	30.03	26.16	31 96	28.77	29 00	0 60	13.40%	15.0%	10.472	113 40%	16
LINCOLN NAT	LNC	71 18	65 69	67 51	64.29	66.72	62 52	66.32	1 58	10.71%	13.5%	18.768	110 71%	12
LINEAR TECH	LLTC	34.78	30.78	33 03	29 72	34.42	29.81	32 09	0 72	17 75%	20.6%	9.602	117 75%	14
LIZ CLAIBORNE	LIZ	46.84	43.40	46 18	43 15	44 50	42 19	44 38	0 22	13.67%	14 3%	4.509	113 67%	6
LOCKHEED MARTIN	LMT	103 50	95.84	98 75	91 08	93.24	89 85	95.38	1 40	11 24%	13 0%	40.457	111 24%	9
LOWE'S COMPANIES	LOW	35.74	32 44	33 95	31 13	31 98	30 15	32 57	0.20	15.38%	16 1%	48,638	115 38%	16
LSI LOGIC	LSI	10 19	8 78	10 67	8.95	10 70	8.97	9 71	0.00	17 50%	17 5%	3.990	117 50%	2
M&T BK.	MTB	125 13	118.80	123.21	118.47	123 04	117 68	121 06	2 40	9.17%	11 5%	13.090	109 17%	6
MANOR CARE	HCR	55 33	52 83	53.43	46 07	48.49	46.43	50.43	0.68	14.43%	16 1%	3,862	114 43%	7
MARATHON OIL	MRO	94 14	88 68	91 50	83 00	98 73	90 30	91 06	1 60	9 76%	11.8%	31,370	109 76%	4
MARRIOTT INTL 'A'	MAR	51 50	46 36	48.31	44.79	48 31	44.81	47 35	0 25	15.47%	16.1%	18.447	115 47%	11
MARSH & MCLENNAN	MMC	30 49	28 95	31 75	29.37	32 08	29.75	30.40	0 76	11 08%	14.0%	16.170	111 08%	6
MARSHALL & ILSLEY	MI	49.26	46 40	48 74	46.13	48.62	45.48	47 44	1 08	9.67%	12.3%	12.123	109 67%	12
MASCO	MAS	34.72	29.64	32 06	28.95	30.53	28.51	30 74	0 88	12 43%	15.0%	11.400	112 43%	7
MATTEL	MAT	27 47	24 43	24 78	22 62	23.17	21 52	24 00	0 65	10.00%	13.2%	10.380	110.00%	4
MAXIM INTEGRATED PRDS	MXIM	33.71	30.05	33 72	30 30	32 86	29 91	31 76	0 62	18.77%	21 2%	10.127	118.77%	13
MBIA	MBI	73.48	65.38	70 23	73.49	68 34	71 16	1 36	10.33%	12 6%	8.955	110 33%	6	
MCCORMICK & CO NV	MKC	39 59	37 94	39.36	37 15	39 82	38 44	38.72	0 80	9.59%	12 0%	4.428	109 59%	7
MCDONALDS	MCD	46 21	43 38	45.06	42 54	44 68	41 70	43 93	1 00	8 69%	11 3%	54.009	108 69%	13
MCGRAW-HILL	MHP	69 86	62 77	69.98	65 01	69 25	65 92	67 13	0.82	12 38%	13 8%	22.722	112 38%	5
MCKESSON	MCK	58 07	55 06	56.93	50 80	51 45	48 43	53.46	0 24	14 25%	14.8%	16.143	114 25%	8
MEADWESTVACO	MWV	32 46	29 85	30 74	28.52	30 50	29 15	30 20	0 92	11 00%	14.0%	5.447	111 00%	1
MEDCO HEALTH SLTN	MHS	69.00	57 93	59.45	52 52	55.34	49.56	57 30	0 00	16 79%	16.8%	19.193	116 79%	14
MEDIMMUNE	MEDI	35.06	30.37	35 46	32 32	33.67	31 38	33 04	0 00	38.14%	38.1%	7.394	138 14%	3
MEDTRONIC	MDT	54 69	49.69	54 86	52 21	54 66	51 40	52 92	0 44	13.81%	14.8%	56.578	113 81%	11
MELLON FINL	MEL	46.24	42 50	44 24	41 80	43.08	39 59	42 91	0 88	11 51%	13 9%	17.625	111 51%	12
MERCK & CO	MRK	45.44	42 35	46.55	43 16	45 90	42 63	44 34	1 52	7 32%	11 2%	95.937	107 32%	10
MEREDITH	MDP	60 39	57 35	59.05	55 68	57 29	53 60	57 23	0.74	11 88%	13 4%	2.232	111 88%	4
MERRILL LYNCH & CO	MER	95 18	82 50	98.68	91 27	93 93	85 82	91 23	1.40	12 75%	14.6%	72.441	112 75%	7
METLIFE	MET	66 25	62 12	62 87	58.74	59.72	57 21	61 15	0 59	11 01%	12.1%	47.499	111 01%	10
MGIC INVT	MTG	70 10	59 55	63.83	58.55	63.50	57 45	62 16	1 00	10.28%	12.2%	4.786	110.28%	7
MICRON TECHNOLOGY	MU	13.25	11 76	14 31	12 79	15.05	13.12	13 38	0 00	15.33%	15.3%	8.929	115.33%	10
MICROSOFT	MSFT	30.94	27 79	31 48	29.40	30 26	28.80	29.78	0 40	13.64%	15.3%	271.835	113 64%	16
MILLIPORE	MIL	76.13	68.49	69 29	65 29	70 16	66.41	69 30	0.00	15.80%	15.8%	3.834	115 80%	5
MOLEX	MOLX	31 00	29 25	32 34	28 16	33 63	31 55	30 99	0 30	14 57%	15 7%	2.831	114 57%	7
MOLSON COORS BREWING 'B'	TAP	88.06	80 30	81 30	75 11	76 99	70 90	78.78	1 28	11 07%	13.0%	5.407	111 07%	6
MONSANTO	MON	57 08	51 04	56.24	49 10	53.49	47 12	52 35	0.50	21 53%	22.8%	27.675	121 53%	6
MONSTER WORLDWIDE	MNST	54 79	48 81	51 39	45.77	48 20	41 86	48.47	0 00	25 40%	25.4%	5.877	125 40%	15
MOODYS	MCO	76 09	63 51	72 60	67 54	71 70	68.81	70 04	0 32	14 07%	14.6%	18.495	114.07%	7
MORGAN STANLEY	MS	84 39	73 04	84 66	79 60	83 40	74.51	79 93	1 08	13 19%	14.8%	78.275	113 19%	9
MOTOROLA	MOT	19 98	18 25	20.91	17 90	22 55	20.17	19 96	0 20	11 81%	13.0%	45.062	111 81%	12
MURPHY OIL	MUR	53 00	48 86	50 91	45.45	54.39	50.06	50.45	0 60	10.17%	11.6%	9.501	110 17%	4
MYLAN LABORATORIES	MYL	22 75	20.99	22 15	19 90	20.92	19.72	21 07	0 24	15 80%	17 2%	4.383	115 80%	5
NABORS INDS.	NBR	32 74	29.27	30 51	27 53	34.62	29.65	30.72	0 00	18.00%	18.0%	8.727	118.00%	3
NAT CITY	NCC	38.52	37 43	38 35	34 82	37.43	35.29	36.97	1 56	7 21%	12 1%	24.082	107 21%	7
NATIONAL OILWELL VARCO	NOV	71 03	59.69	61 95	53 75	68 60	60 80	62 64	0.00	27 56%	27 6%	12.053	127 56%	3
NATIONAL SEMICON.	NSM	26.15	22 20	23 62	21 65	25 18	22.42	23 54	0.16	13 86%	14 7%	7.954	113 86%	7
NCR	NCR	48 25	45.45	47 60	42 34	43 40	40 67	44 62	0.00	9 00%	9.0%	8.135	109 00%	3
NETWORK APPLIANCE	NTAP	40 62	36 61	40.89	36.20	41 56	38 26	39 02	0 00	23 67%	23 7%	13,952	123 67%	12
NEW YORK TIMES 'A'	NYT	26 90	23 15	24 37	22 77	24.61	23 55	24 23	0 70	7 70%	11.0%	3,524	107 70%	6
NEWELL RUBBERMAID	NWL	31 95	29 54	30.65	28 66	29.50	28 31	29 77	0 84	9 38%	12.7%	8.413	109 38%	8
NEWMONT MINING	NEM	48 33	43 79	45.67	41 91	47 80	44 76	45 38	0.40	20.00%	21 1%	18.216	120.00%	2
NEWS CORP 'A'	NWS A	24 10	22 21	23.40	21 14	21 94	20.29	22 18	0 12	18.00%	18 7%	47.928	118 00%	3
NICOR	GAS	48 33	45 35	47 38	44.46	49.86	46.46	46.97	1 86	3 10%	7 5%	2.036	103.10%	1
NIKE 'B'	NKE	108.90	98 44	100 35	94 92	101 20	94.79	99.77	1 48	13.56%	15.3%	19.535	113 56%	9
NISOURCE	NI	24 80	23 67	24.49	23 04	28.03	23.72	24 63	0 92	3.33%	7 5%	6.427	103 33%	6
NOBLE	NE	76 71	68 81	76.02	67 98	82 31	75.01	74.47	0.16	46 25%	46 6%	9.368	146 25%	4
NORDSTROM	JWN	59.70	51 12	55 99	50.00	51.40	47 26	52 58	0.54	13 80%	15.0%	13.471	113 80%	14
NORFOLK SOUTHERN	NSC	52 68	46.68	53 84	47 05	51 98	48 62	50 14	0 88	15.45%	17.6%	18.396	115 45%	4
NORTHERN TRUST	NTRS	63.49	59.72	62 69	58 66	61 40	56 00	60 33	1 00	12 05%	14.0%	12.973	112 05%	14
NORTHROP GRUMMAN	NOC	75.72	70.50	71 92	66 23	68 77	66 04	69 86	1.48	11 67%	14.2%	25.152	111 67%	10
NOVELL	NOVL	7 32	6 18	7 35	6 05	6.36	5 70	6 49	0 00	11 33%	11 3%	2.187	111 33%	6
NOVELLUS SYSTEMS	NVLS	33.09	30 46	34.97	29 63	35.00	31 43	32 43	0 15	17 75%	18.3%	3.858	117 75%	8
NUCOR	NUE	66.99	59 42	64 88	53 20	67 55	54 60	61 11	0 44	6 66%	7 5%	17.746	106 66%	4

NVIDIA	NVDA	34 91	30 30	37 52	29 91	38.96	34 90	34.42	0 00	16 47%	16 5%	10.494	116.47%	9
OCCIDENTAL PTL.	OXY	48.75	45.60	48.86	42 06	52 40	48.04	47 62	0.88	8 28%	10 4%	38,606	108 28%	5
OFFICE DEPOT	ODP	38.13	33 02	39.66	36 72	41 06	36.87	37 58	0 00	14.54%	14 5%	9.293	114 54%	11
OFFICEMAX	OMX	55.40	48 29	51 23	47 87	51.80	46.44	50 17	0 60	15.40%	16 9%	3.767	115.40%	5
OMNICOM GP	OMC	106 90	100.61	105 30	100 57	106.06	102 40	103.64	1 00	11 42%	12.6%	17.231	111 42%	11
ORACLE	ORCL	17.44	16 00	17 98	16.77	19 34	16 93	17 41	0 00	14.31%	14.3%	86,594	114 31%	17
PACCAR	PCAR	74 23	66 70	69 72	63.23	69 25	63.42	67 76	0 80	11 31%	12.7%	16.981	111 31%	7
PACTIV	PTV	33 56	31 56	36 91	31 58	36.53	33 60	33.96	0 00	11 00%	11.0%	4.218	111 00%	4
PALL	PLL	36.34	34.36	35 19	33 23	35.57	30 81	34 25	0.48	11 00%	12.6%	4.453	111 00%	4
PARKER-HANNIFIN	PH	88.19	81 81	84 65	75 62	84.89	76.73	81 98	1 04	11 28%	12.6%	9.731	111 28%	7
PATTERSON COMPANIES	PDCO	39.76	31 71	38 29	35 13	38.28	35.47	36.44	0.00	16 14%	16.1%	4.606	116.14%	7
PAYCHEX	PAYX	42 50	40.03	41 00	38 79	41 21	38.66	40.37	0.84	15 71%	18 3%	14.924	115.71%	16
PEABODY ENERGY	BTU	44.60	39.50	41 96	36 20	48.59	40.29	41 86	0.24	20 01%	20 7%	10.273	120 01%	4
PENNEY JC	JCP	87 18	79 52	84 09	75 23	81 78	75.98	80 63	0.72	15 48%	16.6%	17.731	115.48%	10
PEPSI BOTTLING GP	PBG	32 54	30 93	31 99	30.13	32 31	30.59	31 42	0.44	9 63%	11 3%	7,283	109 63%	6
PEPSICO	PEP	65.39	62 50	65.54	62 29	64 17	61.46	63 56	1 20	11 02%	13.2%	103.064	111 02%	8
PERKINELMER	PKI	24 66	23 35	23.94	21 28	22 58	21 12	22 82	0 28	13.00%	14.5%	2.834	113 00%	3
PFIZER	PFE	27 00	24 94	27.41	25.78	27 86	23 50	26 08	1 16	4 80%	9.8%	175.685	104 80%	11
PG & E	PCG	49 32	45 50	47 95	45.34	48 17	45 66	46.99	1 32	7 80%	11.0%	16.018	107 80%	5
PHELPS DODGE	PD	128.00	121 19	124 77	114 25	124.75	116.68	121 61	0 80	24 13%	25.0%	25.120	124.13%	3
PINNACLE WEST CAP	PNW	49.05	47 21	51 67	48 09	51 00	48.96	49.33	2 10	4.53%	9.3%	4.734	104.53%	3
PITNEY-BOWES	PBI	48 95	47 16	48.50	45 87	47 05	45.96	47 25	1 32	10.00%	13 3%	10.348	110.00%	3
PLUM CREEK TIMBER	PCL	41 64	38.64	41 98	38 15	40.00	36.64	39 51	1 68	6.57%	11 4%	6,860	106.57%	3
PMC-SIERRA	PMCS	7.47	6.31	6 78	6 06	7 97	6 40	6.83	0.00	18 75%	18 8%	1.336	118.75%	4
PNC FINL SVS GP	PNC	76.41	72 80	75.65	72 02	75 15	70 55	73 76	2 20	9 67%	13 2%	21.522	109 67%	9
POLO RALPH LAUREN 'A'	RL	89 07	81 66	84.10	77 90	83 15	76.17	82.01	0 20	15.80%	16 1%	5.054	115 80%	10
PPG INDUSTRIES	PPG	69 09	64.84	67 88	64 01	66 69	63 02	65 92	2.00	9 04%	12.6%	10.739	109 04%	6
PPL	PPL	39 68	35 14	36 66	34.43	37 34	35 50	36.46	1 22	11 50%	15.5%	14.442	111 50%	6
PRAXAIR	PX	65.00	60 23	63 35	57 97	63 27	58 51	61 39	1 20	11 55%	13.9%	19.555	111 55%	8
PRINCIPAL FINL.GP	PFG	64 17	59.71	61 86	58 19	59.40	56 85	60.03	0 80	12 13%	13.7%	16.083	112 13%	9
PROCTER & GAMBLE	PG	65.64	61 25	66.30	63 11	64 73	62 21	63.87	1 24	11.45%	13.7%	199.294	111 45%	12
PROGRESS ENERGY	PGN	50.95	47 48	50.00	47 05	49.55	47 68	48.79	2 44	4 06%	9.6%	12.318	104 06%	5
PROGRESSIVE OHIO	PGR	23.76	22 50	24 75	22 90	24.73	22 19	23.47	0.03	8 17%	8 3%	17.321	108.17%	6
PROLOGIS	PLD	72 08	64.12	65.08	57 32	65.81	59.16	63 93	1 84	19.00%	22 6%	15.846	119 00%	1
PRUDENTIAL FINL	PRU	93 26	89.05	89.33	85.38	87 18	81 00	87 53	0 95	13.35%	14 7%	43,606	113.35%	9
PUB SER.ENTER GP	PEG	78 03	66 48	67 75	64.32	68 10	65 70	68 40	2 34	8 67%	12.6%	18,630	108.67%	3
PUBLIC STORAGE	PSA	117 16	100.93	109 41	96.02	98 05	94.01	102 60	2 00	8.00%	10.2%	16,623	108 00%	1
PULTE HOMES	PHM	35 56	29.31	34 90	31 03	35.31	32 00	33.02	0.16	13 25%	13.8%	7.552	113 25%	4
QLOGIC	QLGC	18 81	17 41	22.46	18 10	22 72	21 30	20.13	0.00	14.41%	14.4%	2.723	114 41%	9
QUALCOMM	QCOM	43.61	37 00	39 96	36 79	40.99	35.80	39 02	0.48	18 10%	19.6%	65.399	118 10%	10
QUEST DIAGNOSTICS	DGX	54 29	50.30	52 91	48 82	54.20	51 34	51 98	0.40	13 00%	13 9%	9.666	113 00%	9
QUESTAR	STR	86.32	79 33	82 81	75 96	89 56	82.45	82 74	0.94	11 82%	13 2%	7.081	111 82%	5
QWEST COMMS INTL	Q	8 90	7 87	8 63	8 06	8.47	7 50	8.24	0 00	8 00%	8.0%	16,208	108.00%	9
RADIOSHACK	RSH	26.24	21 78	22 24	16 69	17.85	16.42	20 20	0 25	10.35%	11.8%	3.336	110 35%	10
RAYTHEON 'B'	RTN	55.63	51 90	53.22	50.96	54 17	51 00	52 81	0 96	16.16%	18.4%	23,474	116 16%	8
REALOGY	H	30 08	29 55	30.30	29.42	31 11	25.41	29.31	0 00	15.00%	15.0%	7.396	115 00%	1
REGIONS FINL NEW	RF	37 61	35 31	38 17	35.76	37 99	36 40	36.87	1 44	7 83%	12 3%	25.867	107 83%	9
REYNOLDS AMERICAN	RAI	65 10	60 05	66.19	62 00	66 34	63 56	63.87	3.00	6.25%	11 6%	17.635	106 25%	4
ROBERT HALF INTL.	RHI	42 21	38.44	41.40	37 02	38.87	36.61	39 09	0.40	18 25%	19.5%	6.336	118.25%	8
ROCKWELL AUTOMATION	ROK	65 31	61 01	63 01	56 73	65.69	60.34	62 02	1 16	11 83%	14 0%	10.071	111 83%	6
ROCKWELL COLLINS	COL	69.91	64.39	69 75	62.45	64.31	59.80	65 10	0 64	13.46%	14.6%	11.001	113.46%	12
ROHM & HAAS	ROH	55.95	51 59	57 54	50 13	52 99	50 32	53 09	1 32	11 53%	14 5%	11.321	111 53%	9
ROWAN COS	RDC	33.20	30.07	33.04	29.97	37 99	32 90	32 86	0.40	27 37%	29.0%	3.356	127 37%	6
RYDER SYSTEM	R	55.62	51 20	54.75	51 55	52 89	50 36	52 73	0.84	11.42%	13.3%	3.058	111 42%	5
SABRE HDG	TSG	32 61	32 10	32.47	31 82	32 12	27 17	31 38	0 52	10 66%	12.6%	4.327	110 66%	3
SAFECO	SAF	69 15	64.07	64 61	57 43	64.85	60 37	63.41	1 20	9.88%	12 1%	7.618	109 88%	8
SAFEWAY	SWY	37 24	33 72	36.24	32 86	35 61	30 36	34.34	0.23	10.45%	11.2%	15.019	110 45%	8
SANDISK	SNDK	42 20	36 13	46 24	38.89	46 98	42 00	42 07	0.00	16 53%	16.5%	8.603	116 53%	7
SANMINA-SCI	SANM	3.94	3.42	3.66	3.24	3 92	3.42	3.60	0.00	15 50%	15.5%	1.892	115.50%	6
SARA LEE	SLE	17 49	16.00	17 30	16 59	17 18	16.50	16 84	0.40	6.81%	9 5%	11,963	106.81%	6
SCHERING-PLOUGH	SGP	25.24	23.00	25.37	23 09	24 07	21 78	23 76	0.26	24 23%	25 7%	34.173	124.23%	11
SCHLUMBERGER	SLB	65.79	61 80	64.37	55 68	69 18	61 68	63 08	0 70	21 97%	23 4%	73,364	121 97%	5
SCRIPPS E W 'A'	SSP	49.42	44 35	53.39	48.37	50 90	48 65	49 18	0.48	10 81%	12.0%	5.694	110 81%	7
SEALED AIR	SEE	67 74	63 56	66.32	63.02	65 76	58 55	64 16	0 80	11.40%	12.9%	5.082	111 40%	5
SEARS HOLDINGS	SHLD	189 97	175.77	181 67	164 31	178.00	166.07	175.97	0.00	10 33%	10.3%	27.256	110 33%	3
SEMPRA EN	SRE	62 53	57 25	58.01	54.73	57 35	54 57	57 41	1 24	6.11%	6.5%	15.555	106 11%	5
SHERWIN-WILLIAMS	SHW	71 11	64 65	69 27	61 28	64 76	61 43	65.42	1 26	11 17%	13 4%	8.746	111 17%	3
SIGMA ALDRICH	SIAL	42 91	37.65	40.00	37 40	39.68	37 64	39 21	0.46	9.41%	10.8%	5.332	109.41%	6
SIMON PR GP	SPG	123.96	110.60	115.09	98 50	104 08	97 83	108 34	3.36	7 00%	10 5%	24.064	107 00%	1
SLM	SLM	46 64	40 30	49 96	43 97	50.34	45.51	46 12	1 00	15.52%	18 2%	17.241	115 52%	9

SMITH INTL	SII	42 92	39.49	41 07	36 13	44 68	40 81	40.85	0 40	18.00%	19 2%	8,223	118 00%	4
SNAP-ON	SNA	51 66	48.50	48.42	46.46	48 65	46.76	48.41	1 08	10.67%	13 3%	2.893	110 67%	3
SOLECTRON	SLR	3 48	3 21	3.51	3 18	3.48	3 10	3 33	0.00	14.95%	15.0%	2.803	114 95%	7
SOUTHERN	SO	36.95	35.11	37 25	36.10	37 40	36.16	36.50	1 55	5 20%	10.0%	26.293	105 20%	5
SOUTHWEST AIRLINES	LUV	16.14	15.00	16 58	14 95	16.03	15.18	15.65	0.02	10.18%	10.3%	11.984	110 18%	4
SOVEREIGN BANC	SOV	26.59	24 87	25 91	23.64	26.60	24.64	25.38	0.32	8 13%	9.6%	11.747	108 13%	8
SPECTRA ENERGY	#NA	27 13	25.05	30 00	25.11	29 00	27 50	27 30	0.88	5 33%	8.9%	15.857	105 33%	3
SPRINT NEXTEL	S	19.81	17 57	19.78	16.93	19.92	18.61	18 77	0 10	8.74%	9.4%	55.438	108 74%	9
ST JUDE MED	STJ	43.46	38 96	43.20	34 90	39 07	36.37	39 33	0 00	15.97%	10.0%	13,597	115 97%	14
STANLEY WORKS	SWK	58 99	55 05	57 54	49 95	51 96	48 61	53.68	1 20	11 57%	14.2%	4.504	111 57%	7
STAPLES	SPLS	27 66	25 60	27 62	25 29	28.00	24 94	26 52	0 29	16 20%	17.5%	18,391	116 20%	10
STARBUCKS	SBUX	35.42	30.24	36.61	33 49	37 14	34 90	34 63	0 00	22.00%	22.0%	22.439	122 00%	15
STARWOOD HTLS.& RSTS WOR	HOT	69.65	63.00	64.45	59.63	65.98	62 02	64.12	1 68	14 72%	17 9%	13,672	114 72%	9
STATE STREET	STT	72 14	64.78	72.82	67 31	68 56	60 96	67 76	0 84	12 60%	14.1%	21.727	112 60%	12
STRYKER	SYK	64 27	59.44	62 37	54 89	55.92	51 90	58.13	0.22	19.19%	19 7%	24.837	119.19%	13
SUN MICROSYSTEMS	SUNW	6.78	5.40	6.66	5 44	5.88	5 34	5.92	0.00	12 76%	12.8%	21.821	112 76%	5
SUNOCO	SUN	67.46	59 77	63 38	56.68	69 42	62 01	63 12	1 10	12 30%	14 4%	7.750	112 30%	1
SUNTRUST BANKS	STI	87 43	83 09	85.54	81 33	85 64	81 11	84.02	2 92	8 40%	12.4%	30.222	108.40%	13
SUPERVALU	SVU	39.02	36 20	38.23	34.46	36 59	33 93	36.41	0 66	9.20%	11.3%	7.658	109 20%	6
SYMANTEC	SYMC	18 37	16 65	21 86	17 26	21 90	19 64	19 28	0 00	13 01%	13.0%	15.625	113 01%	14
SYNOVUS FINL	SNV	33.82	31 86	32 10	30 39	31 13	29 69	31 50	0 78	12 22%	15.2%	10.448	112 22%	9
SYSCO	SYY	35.23	32 29	36.74	33 80	37 04	35 21	35 05	0 76	13 53%	16.1%	19.744	113 53%	7
T ROWE PRICE GP	TROW	50.30	45.57	48 94	45.03	45.22	42 63	46.28	0 68	12 85%	14 6%	12.164	112 85%	8
TARGET	TGT	64 74	59.40	62 96	56.61	60.00	56.69	60.07	0.48	14 79%	15 8%	52.418	114.79%	17
TECO ENERGY	TE	17 28	16.42	17 49	16.69	17 50	16.91	17 05	0.76	3 88%	8.8%	3,487	103.88%	4
TEKTRONIX	TEK	29 50	28 01	29 70	27 78	31 62	26.40	28 84	0 24	12 75%	13 7%	2.312	112 75%	6
TELLABS	TLAB	10 99	9 93	11 11	9.75	10 82	9.61	10 37	0 00	7 83%	7.8%	4,497	107 83%	6
TEMPLE INLAND	TIN	63 61	48 72	50.58	44 29	46 71	38 92	48.81	1 12	6.00%	8.6%	6.184	106 00%	2
TENET HLTHCR	THC	7 67	6.75	7 68	7 00	7 36	6.75	7 20	0.00	10.00%	10.0%	3.032	110 00%	3
TERADYNE	TER	16.84	14 92	16.46	14 64	15 59	14.43	15.48	0 00	14 75%	14 8%	2.938	114 75%	6
TEREX	TEX	72 75	56.22	62 80	54.75	66.52	54 65	61 28	0.00	8 50%	8 5%	6.418	108 50%	2
TEXAS INSTS	TXN	32 57	29.91	31 34	28.24	30.93	28.43	30.24	0.16	16.65%	17 3%	45.644	116.65%	13
TEXTRON	TXT	98.43	89 52	98.80	90.78	98.50	92 70	94 79	1 55	12 88%	14.8%	11.222	112 88%	8
THE DIRECTV GROUP	DTV	26.09	21 65	25 25	23.82	25.57	22 46	24 14	0.00	17 70%	17 7%	27.666	117 70%	7
THE HERSHEY COMPANY	HSY	54 17	50 56	52 67	49 70	52 09	49.17	51 39	1 08	9.38%	11.8%	9,015	109 38%	10
THE TRAVELERS COS	TRV	54 33	50 45	54 64	50 30	55.00	50 96	52 61	1 04	9.97%	12.3%	34.901	109 97%	7
THERMO FISHER SCIENTIFIC	TMO	49 90	44.56	49.43	44 54	46 34	43 20	46 33	0 00	16 00%	16.0%	18,066	116 00%	2
TIFFANY & CO	TIF	45.98	39.13	40.50	38 17	40 80	37 45	40.34	0 40	11 91%	13 1%	5.809	111 91%	11
TIME WARNER	TWX	21 92	19.20	23 15	21 59	22 25	20 10	21 37	0.22	14.42%	15.7%	76,044	114 42%	8
TJX COS	TJX	29 43	27 22	30 24	27 81	29.46	26.67	28.47	0.28	12 14%	13 3%	12.424	112 14%	7
TORCHMARK	TMK	66.87	63 33	65.49	62 21	64.59	62 50	64 17	0.52	9 56%	10 5%	6,262	109.56%	8
TRANSOCEAN	RIG	80 00	75 31	80 29	72 47	84.23	76.50	78 13	0.00	31 00%	31.0%	22.099	131 00%	3
TRIBUNE	TRB	31 50	29 71	31 24	29 94	32 90	30.74	31 01	0 72	8 74%	11.4%	7.218	108.74%	7
TXU	TXU	68.45	53 67	55.72	52 85	58 26	53.05	57 00	1 73	13 25%	16.9%	30.540	113 25%	4
TYCO INTL	TYC	33 29	30 50	32 32	29 28	31 86	29.40	31 11	0.40	12 71%	14.2%	59.455	112 71%	7
TYSON FOODS 'A'	TSN	19 20	17 55	17 94	15 67	17 09	15 71	17 19	0 16	8.50%	9.6%	4.873	108 50%	4
UNION PACIFIC	UNP	114.20	96.50	101 23	89 58	96 16	89 89	97 93	1 40	17 19%	19.0%	26,384	117 19%	6
UNISYS	UIS	9 47	8 00	8.68	7 78	7 87	7 12	8 15	0.00	8 75%	8 8%	2.859	108 75%	4
UNITED PARCEL SER	UPS	75.32	69 93	75 98	70.38	78.77	73.62	74.00	1 68	12 03%	14 7%	46.253	112 03%	6
UNITED TECHNOLOGIES	UTX	69.49	64 75	68 24	61 85	65.49	61 80	65 27	1 06	12 03%	14.0%	64,079	112 03%	8
UNITEDHEALTH GP	UNH	54 95	50 51	56 29	50.76	54.46	48.49	52 58	0 03	16 11%	16.2%	72.980	116.11%	15
UNIVISION COMMS 'A'	UVN	36 09	35 70	35.97	35.42	35 55	35 28	35.67	0.00	13 00%	13.0%	8.985	113 00%	1
UNUM GROUP	UNM	22.88	20.89	22 25	19 79	20 93	19 90	21 11	0 30	10 00%	11 7%	7.264	110 00%	7
US BANCORP	USB	36.84	34 77	36.29	35.01	36 85	33.45	35 54	1 60	9 09%	14.4%	62.285	109 09%	10
US STEEL	X	94 95	82 55	84.18	68 83	79 01	71 22	80.12	0.80	5 00%	6.1%	10.190	105 00%	3
UST	UST	61 17	57 48	58.81	55 53	59 49	54 96	57 91	2 40	7.00%	11 7%	9.046	107 00%	3
V F	VFC	80.97	74 64	83 29	73.59	83.10	76.92	78.75	2 20	9.67%	12.9%	8,913	109.67%	9
VALERO ENERGY	VLO	59.67	54 62	54.46	47 66	57 09	50.90	54 07	0.48	3.10%	4 1%	34.434	103.10%	1
VARIAN MED SYS	VAR	50.05	45.85	50 21	44 01	50.80	46.77	47 95	0 00	15 83%	15.8%	5.780	115.83%	6
VERISIGN	VRSN	26.78	24.72	24 79	22 92	26.00	23.99	24 87	0 00	15 63%	15.6%	5.984	115 63%	8
VERIZON COMMS	VZ	38.77	35 83	38 68	36.48	37 64	34.43	36 97	1 62	5 19%	10.1%	106.504	105 19%	14
VIACOM 'B'	VIA B	41.47	38.05	42 61	39 66	41 13	37 50	40 07	0 00	13 80%	13 8%	24.986	113 80%	12
VORNADO REALTY TST	VNO	136.55	120.94	126.25	116 29	131 35	119.65	125.17	3.40	8 00%	11 1%	17.273	108 00%	1
VULCAN MATERIALS	VMC	125.79	102 33	102 83	87 27	92 00	86 74	99 49	1 84	11 33%	13 5%	11.125	111 33%	3
WACHOVIA	WB	58 80	54 40	57 57	55 62	57 67	53.63	56.28	2 24	9.19%	13 8%	86.602	109 19%	14
WAL MART STORES	WMT	50 42	47 44	48 78	46 51	46.89	44 80	47.47	0 67	12 56%	14 2%	199.273	112 56%	16
WALGREEN	WAG	46.49	43.39	46.69	44.80	47 28	40.05	44 78	0 31	15 50%	16.3%	44.197	115 50%	11
WALT DISNEY	DIS	36.09	32 65	35 97	33.95	34 89	32 76	34 39	0 31	13 59%	14 7%	70.224	113 59%	12
WASHINGTON MUTUAL	WM	45.80	42 20	46 02	43.49	46.38	43.43	44 55	2 16	11 00%	16.8%	40,247	111 00%	8
WASTE MAN	WMI	38.70	33.45	38.07	35 50	37 90	35 67	36.55	0 96	10.33%	13 4%	17.799	110 33%	3

WATERS	WAT	58.61	53.03	57 76	48 55	51 15	48.35	52 91	0 00	15.50%	15.5%	5,584	115.50%	4
WATSON PHARMS	WPI	29.43	26 27	27 38	25 32	27 33	25.28	26.84	0 00	15.74%	15.7%	2.635	115.74%	7
WEATHERFORD INTL.	WFT	42 54	38.65	41 65	35 90	47 05	41 39	41 20	0.00	24.20%	24.2%	13.641	124.20%	5
WELLPOINT	WLP	84.15	77 01	79.05	73.88	78.98	75.00	78.01	0 00	15.05%	15.1%	49.031	115.05%	12
WELLS FARGO & CO	WFC	36.36	33 80	36.64	35.37	36.16	35.01	35.56	1 12	11 19%	14.9%	116,268	111 19%	16
WENDY'S INTL.	WEN	34.42	31 27	34 54	32 68	35.33	32 12	33.39	0 34	12 59%	13.8%	3,697	112 59%	11
WESTERN UNION	#NA	23.56	21 42	23.34	20.74	24.14	21 92	22 52	0 04	12.41%	12.6%	16.130	112.41%	17
WEYERHAEUSER	WY	87 09	74.65	76.55	70.71	75.50	64 12	74.77	2 40	6.33%	10.0%	20,384	106 33%	3
WHIRLPOOL	WHR	96.77	88.01	91 68	83.23	87 51	80.80	88.00	1 72	15.67%	18 1%	6.840	115 67%	3
WHOLE FOODS MARKET	WFMI	52.43	43.17	47 32	42 13	49.75	46.75	46.93	0.72	17 11%	19.0%	6.499	117 11%	9
WILLIAMS COS	WMB	28 71	26.46	27 23	25.17	28 05	26 05	26.95	0.36	17 25%	18.9%	15.642	117 25%	4
WINDSTREAM	WIN	15.63	14 50	15.20	13.75	14.43	13 54	14 51	1 00	2 33%	10.0%	6.856	102 33%	3
WRIGLEY WILLIAM JR	WWY	53.45	48.52	52 56	49 54	53 30	50.88	51 38	1 16	10.42%	13.1%	10.772	110.42%	9
WYETH	WYE	51 00	48.52	52 25	48 78	51 54	48 05	50 02	1 04	7 86%	10.2%	65,720	107 86%	11
WYNDHAM WORLDWIDE	WYN	35 62	31 09	32 90	29 72	33 39	30 75	32 24	0.00	12 50%	12 5%	6.889	112 50%	2
XCEL ENERGY	XEL	24.73	23 29	23 62	22 78	23 63	22 71	23.46	0.89	5.60%	9.9%	9.497	105 60%	5
XEROX	XRX	18.32	17 10	17 30	16 12	17 29	16 20	17.06	0.00	11 75%	11 8%	16,294	111 75%	4
XILINX	XLNX	26.79	24.08	25.04	22.68	27 30	23 40	24 88	0.48	16 28%	18 7%	8.396	116 28%	9
XL CAP 'A'	XL	74.40	69.04	72 80	66 93	72 62	70.00	70.97	1 52	11 76%	14 3%	12.584	111 76%	10
XTO EN	XTO	53.79	49 16	50.80	43 86	50.94	46.45	49.17	0.48	16.79%	18.0%	18,399	116.79%	8
YAHOO	YHOO	32 84	28 15	29.88	25 26	27 61	25.13	28.15	0 00	26.57%	26.6%	41.266	126 57%	17
YUM! BRANDS	YUM	62 22	56 47	60.38	57 40	63.48	57 82	59.63	1 20	11 51%	13.9%	14.898	111 51%	12
ZIMMER HDG.	ZMH	87 27	81 74	85.00	76.90	79.11	72 88	80.48	0 00	14.97%	15.0%	19.900	114.97%	13
ZIONS BANCORP	ZION	88 56	84.18	84 95	81 18	83.15	77 37	83.23	1 56	9.90%	12.1%	9.082	109 90%	12
Market-weighted Average											14 2%			
Simple Average											14 3%			

KENTUCKY-AMERICAN WATER COMPANY
CASE NO. 2007-00143
ATTORNEY GENERAL'S REQUEST FOR INFORMATION

Item 19 of 312

Witness: Dr. James H. Vander Weide

19. RE: Vander Weide Direct Testimony. With respect to page 45, lines 11-23, please provide:

    (a) All regulatory cases in which Dr. Vander Weide has provided a rate of return or cost of equity recommendation since January 1, 2000,

    (b) All regulatory cases in which Dr. Vander Weide has provided a rate of return or cost of equity recommendation since January 1, 2000 using a market-value capital structure for ratemaking purposes, and

    (c) Copies of the rate of return section of all rate orders in which regulatory commissions have adopted Dr. Vander Weide's market-value capital structure for ratemaking purposes.

Response:

(a) The requested data are attached.

(b) The requested data are attached.

(c) Dr. Vander Weide does not routinely receive or maintain information on the orders issued by the state commissions in the dockets in which he has testified.

For electronic version, refer to KAW_R_AGDR1#19_061807.pdf

Kentucky-American Water Company
Response to Request No 19 (a)

COMPANY	JURISDICTION	DATE	DOCKET NO.
Duke Energy Carolinas	North Carolina	May-07	E-7 Sub 828 et al
North Carolina Rate Bureau (homeowners)	North Carolina	Dec-06	
San Diego Gas & Electric	FERC	Nov-06	ER07-284-000
North Carolina Rate Bureau (workers compensation)	North Carolina	Aug-06	
Union Electric Company d/b/a AmerenUE	Missouri	Jun-06	ER-2007-0002
North Carolina Rate Bureau (homeowners)	North Carolina	May-06	
North Carolina Rate Bureau (dwelling fire)	North Carolina	Mar-06	
Empire District Electric Company	Missouri	Feb-06	ER-2006-0315
Verizon Maine	Maine	Dec-05	2005-155
Dominion Virginia Power	Virginia	Nov-05	PUE-2004-00048
Empire District Electric Company	Kansas	Sep-05	05-EPDE-980-RTS
North Carolina Rate Bureau (workers comp)	North Carolina	Sep-05	
Verizon Southwest	Texas	Jul-05	29315
PG&E Company	FERC	Jul-05	ER-05-1284
Dominion Hope	West Virginia	Jun-05	05-034-G42T
Verizon New England	U S District Court New Hampshire	May-05	04-CV-65-PB
San Diego Gas & Electric	California	May-05	05-05-012
Progress Energy	Florida	May-05	50078
North Carolina Rate Bureau (homeowners)	North Carolina	Feb-05	
Verizon Vermont	Vermont	Feb-05	6959
Verizon Florida	Florida	Jan-05	050059-TL
Verizon Illinois	Illinois	Jan-05	00-0812
Dominion Resources	North Carolina	Sep-04	E-22 Sub 412
Tennessee-American Water Company	Tennessee	Aug-04	04-00288
Valor Telecommunications of Texas, LP	New Mexico	Jul-04	3495 Phase C
PG&E Company	California	May-04	04-05-21
Verizon Northwest	Washington	Apr-04	UT-040788
Empire District Electric Company	Missouri	Apr-04	ER-2004-0570
MidAmerican Energy	South Dakota	Apr-04	NG4-001
Kentucky-American Water Company	Kentucky	Apr-04	2004-00103
Interstate Power and Light Company	Iowa	Mar-04	RPU-04-01
Northern Natural Gas Company	FERC	Feb-04	RP04-155-000
North Carolina Rate Bureau (auto)	North Carolina	Feb-04	
Verizon New Jersey	New Jersey	Jan-04	TO00060356
Verizon	FCC	Jan-04	03-173, FCC 03-224
Verizon	FCC	Dec-03	03-173, FCC 03-224
Phillips County Telephone Company	Colorado	Nov-03	03S-315T
Verizon California Inc	California	Nov-03	R93-04-003,I93-04-002
PG&E Company	FERC	Oct-03	ER04-109-000
North Carolina Rate Bureau (homeowners)	North Carolina	Oct-03	
Allstate Insurance Company	Texas	Sep-03	2568
Verizon Northwest Inc	Washington	Jul-03	UT-023003
Empire District Electric Company	Oklahoma	Jul-03	Case No PUD 200300121
Verizon Virginia Inc	FCC	Apr-03	CC-00218,00249,00251
Northern Natural Gas Company	FERC	Apr-03	RP03-398-000
North Carolina Rate Bureau (dwelling fire)	North Carolina	Apr-03	
MidAmerican Energy	Iowa	Apr-03	RPU-03-1, WRU-03-25-156
PG&E Company	FERC	Mar-03	ER03666000
Verizon North	Indiana	Feb-03	42259
San Diego Gas & Electric	FERC	Feb-03	ER03-601000
Verizon Florida Inc	Florida	Feb-03	981834-TP/990321-TP
PG&E Company	FERC	Jan-03	ER03409000
North Carolina Rate Bureau (auto)	North Carolina	Jan-03	
Verizon New England Inc New Hampshire	New Hampshire	Dec-02	DT 02-110

PG&E Company	California	Dec-02	
Verizon Northwest	Washington	Dec-02	UT 020406
MidAmerican Energy	Iowa	Nov-02	RPU-02-10
North Carolina Rate Bureau (workers comp)	North Carolina	Sep-02	
Verizon Michigan	US District Court Eastern District of Mic	Sep-02	Civil Action No 00-73208
Verizon New England Inc New Hampshire	New Hampshire	Aug-02	DT 02-110
PG&E Company	California	May-02	A 02-05-022 et al
Verizon New England Inc Rhode Island	Rhode Island	May-02	Docket No 2681
Verizon New England Inc Massachusetts	FCC	May-02	EB 02 MD 006
MidAmerican Energy Company	Iowa	Mar-02	RPU 02 2
North Carolina Rate Bureau (homeowners)	North Carolina	Mar-02	
North Carolina Natural Gas Company	North Carolina	Feb-02	G21 Sub 424
North Carolina Rate Bureau (auto)	North Carolina	Jan-02	
Verizon Pennsylvania	Pennsylvania	Dec-01	R-00016683
PG&E Company	FERC	Nov-01	ER0166000
Verizon Florida	Florida	Nov-01	990648-TP
Verizon Delaware	Delaware	Oct-01	96-324 Phase II
Florida Power Corporation	Florida	Sep-01	000824-EI
North Carolina Rate Bureau (workers comp)	North Carolina	Sep-01	
Verizon Washington DC	Washington, D C	Jul-01	962
Sherburne County Rural Telephone Company	Minnesota	Jul-01	P427/CI-00-712
Verizon Virginia	FCC	Jul-01	CC-00218,00249,00251
Verizon Maryland	Maryland	May-01	8879
Verizon Massachusetts	Massachusetts	May-01	DTE 01-20
North Carolina Rate Bureau (auto)	North Carolina	Apr-01	
PG&E Company	FERC	Mar-01	ER011639000
Verizon New York	New York	Oct-00	98-C-1357
PG&E Company	FERC	Oct-00	ER0166000
Verizon New Jersey	New Jersey	Oct-00	TO00060356
North Carolina Rate Bureau (workers comp)	North Carolina	Sep-00	
Verizon New Jersey	New Jersey	Sep-00	TO99120934
PG&E Company	California	Aug-00	00-05-018
Verizon New York	New York	Jul-00	98-C-1357
PG&E Company	California	May-00	00-05-013
PG&E Company	FERC	Mar-00	ER00-66-000
PG&E Company	FERC	Mar-00	ER99-4323-000
Bell Atlantic	New York	Feb-00	98-C-1357
USTA	FCC	Jan-00	94-1, 96-262

Kentucky-American Water Company
Response to Request No 19 (b)

COMPANY	JURISDICTION	DATE	DOCKET NO.
Duke Energy Carolinas	North Carolina	May-07	E-7 Sub 828 et al
San Diego Gas & Electric	FERC	Nov-06	ER07-284-000
Union Electric Company d/b/a AmerenUE	Missouri	Jun-06	ER-2007-0002
Empire District Electric Company	Missouri	Feb-06	ER-2006-0315
Verizon Maine	Maine	Dec-05	2005-155
Dominion Virginia Power	Virginia	Nov-05	PUE-2004-00048
Empire District Electric Company	Kansas	Sep-05	05-EPDE-980-RTS
Verizon Southwest	Texas	Jul-05	29315
PG&E Company	FERC	Jul-05	ER-05-1284
Dominion Hope	West Virginia	Jun-05	05-034-G42T
Verizon New England	U S District Court N	May-05	04-CV-65-PB
San Diego Gas & Electric	California	May-05	05-05-012
Progress Energy	Florida	May-05	50078
Verizon Vermont	Vermont	Feb-05	6959
Verizon Florida	Florida	Jan-05	050059-TL
Verizon Illinois	Illinois	Jan-05	00-0812
Dominion Resources	North Carolina	Sep-04	E-22 Sub 412
Valor Telecommunications of Texas, LP	New Mexico	Jul-04	3495 Phase C
PG&E Company	California	May-04	04-05-21
Verizon Northwest	Washington	Apr-04	UT-040788
Empire District Electric Company	Missouri	Apr-04	ER-2004-0570
MidAmerican Energy	South Dakota	Apr-04	NG4-001
Verizon New Jersey	New Jersey	Jan-04	TO00060356
Verizon	FCC	Jan-04	03-173, FCC 03-224
Verizon	FCC	Dec-03	03-173, FCC 03-224
Verizon California Inc	California	Nov-03	R93-04-003.193-04-002
PG&E Company	FERC	Oct-03	ER04-109-000
Verizon Northwest Inc	Washington	Jul-03	UT-023003
Verizon Virginia Inc	FCC	Apr-03	CC-00218.00249.00251
PG&E Company	FERC	Mar-03	ER03666000
Verizon North	Indiana	Feb-03	42259
San Diego Gas & Electric	FERC	Feb-03	ER03-601000
Verizon Florida Inc	Florida	Feb-03	981834-TP/990321-TP
PG&E Company	FERC	Jan-03	ER03409000
Verizon New England Inc New Hampshire	New Hampshire	Dec-02	DT 02-110
Verizon Northwest	Washington	Dec-02	UT 020406
Verizon Michigan	US District Court E:	Sep-02	Civil Action No 00-73208
Verizon New England Inc New Hampshire	New Hampshire	Aug-02	DT 02-110
Verizon New England Inc Rhode Island	Rhode Island	May-02	Docket No 2681
Verizon New England Inc Massachusetts	FCC	May-02	EB 02 MD 006
Verizon Pennsylvania	Pennsylvania	Dec-01	R-00016683
Verizon Florida	Florida	Nov-01	99064B-TP
Verizon Delaware	Delaware	Oct-01	96-324 Phase II
Verizon Washington DC	Washington, D C	Jul-01	962
Verizon Virginia	FCC	Jul-01	CC-00218.00249,00251
Verizon Maryland	Maryland	May-01	8879
Verizon Massachusetts	Massachusetts	May-01	DTE 01-20
Verizon New York	New York	Oct-00	98-C-1357
Verizon New Jersey	New Jersey	Oct-00	TO00060356
Verizon New Jersey	New Jersey	Sep-00	TO99120934
Verizon New York	New York	Jul-00	98-C-1357
Bell Atlantic	New York	Feb-00	98-C-1357
USTA	FCC	Jan-00	94-1, 96-262

KENTUCKY-AMERICAN WATER COMPANY
CASE NO. 2007-00143
ATTORNEY GENERAL'S REQUEST FOR INFORMATION

Item 20 of 312

Witness: Dr. James H. Vander Weide

20. RE: Vander Weide Direct Testimony. Please provide an electronic version (Microsoft Excel) of the following Schedules, with all data and equations left intact: Schedules 1, 2, 3, 4, 5, 6, 7, 8, and 9.

Response:

Please refer to electronic file KAW_R_AGDR1#20_061807.xls for the requested data.

For electronic version of this document, refer to KAW_R_AGDR1#20_061807.pdf

KENTUCKY-AMERICAN WATER COMPANY
CASE NO. 2007-00143
ATTORNEY GENERAL'S REQUEST FOR INFORMATION

Item 21 of 312

Witness: Michael A. Miller

21. RE: Mike Miller Direct Testimony. With respect to Exhibit MAM-3, please provide:

(a) All data, work papers, and copies of source documents used in the development of the capitalization amounts (13 Month Average Amounts, and adjustments as reflected in the Add (1) column, and

(b) An electronic version (Microsoft Excel) of Exhibit MAM-3, and all supporting Schedules and work papers used to determine the 13-month capitalization amounts, with all data and equations left intact.

Response:

(a) Please see the schedules attached which include the Business Plan numbers that were the beginning basis for the rate filing (adjusted as required for more recent data included in the rate filing, the Value Line Publication of Feb. 23, 2007 and the detailed pages from Exhibit 37, Schedule J which also were part of the original filing in this case). The Add (1) column is the ITC which the Commission has historically recognized in the capital structure used to determine fair and reasonable rates.

(b) Exhibit MAM-3 is the 13 month average capital structure taken from Exhibit 37, Schedule J. The electronic version of this file is KAW_AGDR1#21b_Exhibit_ MAM3.061807.xls.

For electronic version, refer to KAW_R_AGDR1#21_061807.pdf

Kentucky American
ANNUAL BUSINESS PLAN 2007

CAPITAL STRUCTURE AFTER FINANCING:

3,166,456

		2006 DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	2007 DEC
LONG TERM DEBT (Bonds)		77,000,000	77,000,000	77,000,000	73,900,000	73,900,000	73,900,000	49,900,000	49,900,000	49,900,000	49,900,000	99,900,000	99,900,000	99,900,000
PREFERRED STOCK (Preferred)		5,966,700	5,966,700	5,966,700	5,966,700	5,966,700	5,966,700	5,966,700	5,966,700	5,966,700	5,966,700	5,966,700	5,966,700	5,966,700
SHORT TERM DEBT (Sch.3,L48)		3,297,056	7,677,627	9,328,586	15,864,490	19,006,140	22,053,482	49,244,134	51,725,825	54,160,691	56,861,322	426,815	3,163,866	7,414,309
COMMON EQUITY (Sch.6,L73)		74,381,237	73,187,262	73,129,635	72,552,670	72,577,476	72,696,590	72,672,394	73,357,159	74,088,749	74,554,574	84,155,537	84,584,942	83,500,955
		160,644,993	163,831,589	165,424,921	168,283,860	171,450,316	174,616,772	177,783,228	180,949,684	184,116,140	187,282,596	190,449,052	193,615,508	196,781,964
			163,830,989	165,424,921	168,283,860	171,450,316	174,616,772	177,783,228	180,949,684	184,116,140	187,282,596	190,449,052	193,615,508	196,781,964
% OF TOTAL														
LONG TERM DEBT		47.9%	47.0%	46.5%	43.9%	43.1%	42.3%	28.1%	27.6%	27.1%	26.6%	52.5%	51.6%	50.8%
PREFERRED STOCK		3.7%	3.6%	3.6%	3.5%	3.5%	3.4%	3.4%	3.3%	3.2%	3.2%	3.1%	3.1%	3.0%
SHORT TERM DEBT		2.1%	4.7%	5.6%	9.4%	11.1%	12.6%	27.7%	28.6%	29.4%	30.4%	0.2%	1.6%	3.8%
COMMON EQUITY		46.3%	44.7%	44.2%	43.1%	42.3%	41.6%	40.9%	40.5%	40.2%	39.8%	44.2%	43.7%	42.4%
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Variance														
LONG TERM DEBT (Bonds)			0	0	(3,100,000)	0	0	(24,000,000)	0	0	0	50,000,000	0	0
PREFERRED STOCK (Preferred)			0	0	0	0	0	0	0	0	0	0	0	0
SHORT TERM DEBT (Sch.3,L48)			4,380,571	1,650,959	6,535,904	3,141,650	3,047,342	27,190,652	2,481,691	2,434,866	2,700,631	(56,434,507)	2,737,051	4,250,443
COMMON EQUITY (Sch.6,L73)			(1,193,975)	(57,627)	(576,965)	24,806	119,114	(24,196)	684,765	731,590	465,825	9,600,963	429,405	(1,083,987)
		0	3,186,596	1,593,332	2,858,939	3,166,456	3,166,456	3,166,456	3,166,456	3,166,456	3,166,456	3,166,456	3,166,456	3,166,456
New Fiancings														
Debt	6.30%	0										50,000,000		
Equity		8,000,000										9,000,000		
Total Fiancings		8,000,000	0	0	0	0	0	0	0	0	0	59,000,000	0	0
Replacing Debt	5.65%	0						(24,000,000)						
	4.75%	0												
	6.87%	0			(3,100,000)									
		0	0	0	(3,100,000)	0	0	(24,000,000)	0	0	0	0	0	0
Net		8,000,000	0	0	(3,100,000)	0	0	(24,000,000)	0	0	0	59,000,000	0	0

	2007 DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	2008 DEC
LONG TERM DEBT (Bonds)	99,900,000	99,900,000	99,900,000	106,800,000	106,800,000	106,800,000	106,800,000	106,800,000	106,800,000	106,800,000	123,800,000	123,800,000	123,800,000
PREFERRED STOCK (Preferred)	5,966,700	5,966,700	5,966,700	5,966,700	5,966,700	5,966,700	5,966,700	5,966,700	5,966,700	5,966,700	5,966,700	5,966,700	5,966,700
SHORT TERM DEBT (Sch.3,L46)	7,414,309	10,902,539	12,387,610	820,446	820,446	4,007,270	9,206,224	13,632,482	17,254,649	23,081,291	350,408	1,439,023	4,233,628
COMMON EQUITY (Sch.6,L73)	83,500,955	83,804,289	84,207,515	87,475,794	88,903,828	89,407,769	89,133,176	90,212,302	91,347,610	91,359,897	97,404,537	98,257,453	97,443,389
	196,781,964	200,573,528	202,461,825	201,062,940	202,490,974	206,181,739	211,106,100	216,611,484	221,368,959	227,207,888	227,521,645	229,463,176	231,443,717
% OF TOTAL													
LONG TERM DEBT	50.8%	49.8%	49.3%	53.1%	52.7%	51.8%	50.6%	49.3%	48.2%	47.0%	54.4%	54.0%	53.5%
PREFERRED STOCK	3.0%	3.0%	2.9%	3.0%	2.9%	2.9%	2.8%	2.8%	2.7%	2.6%	2.6%	2.6%	2.6%
SHORT TERM DEBT	3.8%	5.4%	6.1%	0.4%	0.4%	1.9%	4.4%	6.3%	7.8%	10.2%	0.2%	0.6%	1.8%
COMMON EQUITY	42.4%	41.8%	41.6%	43.5%	43.9%	43.4%	42.2%	41.6%	41.3%	40.2%	42.8%	42.8%	42.1%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Variance													
LONG TERM DEBT (Bonds)		0	0	6,900,000	0	0	0	0	0	0	17,000,000	0	0
PREFERRED STOCK (Preferred)		0	0	0	0	0	0	0	0	0	0	0	0
SHORT TERM DEBT (Sch.3,L46)		3,488,230	1,485,071	(11,567,164)	0	3,186,824	5,198,954	4,426,258	3,622,167	5,826,642	(22,730,883)	1,088,615	2,794,605
COMMON EQUITY (Sch.6,L73)		303,334	403,226	3,268,279	1,428,034	503,941	(274,593)	1,079,126	1,135,308	12,287	6,044,640	852,916	(814,064)
	0	3,791,564	1,888,297	(1,398,885)	1,428,034	3,690,765	4,924,361	5,505,384	4,757,475	5,838,929	313,757	1,941,531	1,980,541
New Fiancings													
Debt 6.30%				10,000,000							17,000,000		
Equity				5,000,000							5,000,000		
Total Fiancings	0	0	0	15,000,000	0	0	0	0	0	0	22,000,000	0	0
				(3,100,000)									
	0	0	0	(3,100,000)	0	0	0	0	0	0	0	0	0
Net	0	0	0	11,900,000	0	0	0	0	0	0	22,000,000	0	0

THE VALUE LINE
Investment Survey®

PAGES 4849-4864
File in page order in the *Selection & Opinion* binder.

PART 2 — **Selection & Opinion** — FEBRUARY 23, 2007

Dear Subscribers,

As part of our ongoing efforts to keep *The Value Line Investment Survey* the most valuable investment resource for our subscribers, the entire service is now being released on the Value Line Web Site at 8:00 A.M. Eastern Time on Mondays. You can access each week's issue at www.valueline.com by entering your user name and password. We look forward to continuing to provide you with accurate and timely investment research. Thank you.

Faithfully, Jean Bernhard Buttner

The Quarterly Economic Review

In This Issue

In Three Parts: Part 1 is the Summary & Index. This is Part 2, Selection & Opinion. Part 3 is Ratings & Reports. Volume LXII, Number 26.

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ECONOMIC AND STOCK MARKET COMMENTARY

Three months ago, in our last *Quarterly Economic Review*, we noted that the U.S. economy had slowed abruptly during the middle of 2006, with the rate of business growth moderating from 5.6% in the opening quarter to just 2.6% in the April-to-June period. We then added that this more restrained pace of U.S. economic activity was likely to be the rule over the final six months. That observation was true enough for the third quarter, when the nation's gross domestic product growth moderated somewhat further to 2.0%. However, the economy then showed surprising strength in the fourth quarter as a solid rise in consumer spending helped drive the nation's gross domestic product forward by a solid 3.5%. (Note that this was the initial estimate for fourth-quarter GDP. A revision in the figures, which could very well be downward, is due out on February 28th.) We expect growth to move onto a more measured, but still healthy, 2.5%-3.0% path during the current three months. Once more, the consumer is likely to play a decisive role in this prospective improvement, with some recent reported strength in consumer confidence being indicative of the current good news coming out of this critical sector. Recent gains in nonmanufacturing, a relatively good showing on the employment front (where non-farm payroll growth has averaged 168,000 a month over the past six months), and a firming up in factory orders are added reasons for optimism at this time.

We expect the economy to move forward over the balance of 2007. Once again, we probably will get the cooperation of the U.S. consumer (who accounts for about two-thirds of total GDP). That vital support should be sustained by further likely gains in personal income and employment, resilience in consumer confidence, recent moderation in heating oil and gasoline prices, and a recently strong stock market. Weakness in housing is likely to continue; although the sharp drop in housing demand—which some are still forecasting—may not take place. The reasons are that mortgage rates remain too low and personal income is still too high for a housing collapse, in our view. Our sense is that economic growth will average 2.5%-3.0% in 2007. That pace should be

Continued on page 4852

VALUE LINE FORECAST FOR THE U.S. ECONOMY

Statistical Summary for 2006-2008

	2006:3	2006:4	2007:1	2007:2	2007:3	2007:4	2008:1	2008:2	2007	2008
GDP AND OTHER KEY MEASURES										
Real Gross Domestic Product	11444	*11542*	*11619*	*11697*	*11781*	*11868*	*11956*	*12045*	*11741*	*12093*
Total Light Vehicle Sales (Mill. Units)	16.6	*16.3*	*16.4*	*16.4*	*16.5*	*16.5*	*16.6*	*16.6*	*16.4*	*16.7*
Housing Starts (Million Units)	1.71	*1.56*	*1.58*	*1.55*	*1.55*	*1.57*	*1.58*	*1.58*	*1.56*	*1.60*
Corporate Economic Profits ($Bill.)	1653	*1659*	*1726*	*1719*	*1752*	*1742*	*1830*	*1839*	*1735*	*1839*
ANNUALIZED RATES OF CHANGE										
Gross Domestic Product (Real)	2.0	*3.5*	*2.7*	*2.7*	*2.9*	*3.0*	*3.0*	*3.0*	*2.8*	*3.0*
GDP Deflator	1.9	*1.5*	*2.5*	*2.3*	*2.1*	*2.0*	*2.0*	*2.1*	*2.2*	*2.1*
CPI-All Urban Consumers	2.9	*-2.2*	*2.0*	*2.4*	*2.5*	*2.3*	*2.3*	*2.2*	*2.3*	*2.3*
AVERAGE FOR THE PERIOD										
National Unemployment Rate	4.7	*4.5*	*4.6*	*4.6*	*4.6*	*4.7*	*4.7*	*4.7*	*4.6*	*4.7*
Prime Rate	8.2	*8.2*	*8.3*	*8.3*	*8.3*	*8.2*	*8.0*	*8.0*	*8.3*	*8.0*
10-Year Treasury Note Rate	4.9	*4.6*	*4.8*	*4.8*	*4.9*	*4.9*	*5.0*	*5.0*	*4.8*	*5.1*

Value Line Forecast for the U.S. Economy

	ACTUAL	ESTIMATED						
	2006:3	2006:4	2007:1	2007:2	2007:3	2007:4	2008:1	2008:2
GROSS DOMESTIC PRODUCT AND ITS COMPONENTS (2000 CHAIN WEIGHTED $) BILLIONS OF DOLLARS								
Final Sales	11382	11500	11571	11651	11738	11825	11918	12010
Total Consumption	8111	8199	8266	8325	8383	8443	8506	8569
Nonresidential Fixed Investment	1334	1333	1356	1382	1399	1413	1427	1443
Structures	282	284	291	299	303	304	305	307
Equipment & Software	1061	1056	1071	1090	1108	1125	1140	1154
Residential Fixed Investment	570	541	519	503	495	493	497	501
Exports	1310	1342	1366	1394	1422	1452	1482	1512
Imports	1939	1923	1956	1974	1996	2019	2040	2058
Federal Government	739	747	753	757	764	767	769	771
State & Local Governments	1260	1270	1279	1283	1290	1297	1302	1307
Gross Domestic Product	13323	13487	13671	13834	13998	14161	14343	14517
Real GDP (2000 Chain Weighted $)	11444	11542	11619	11697	11781	11868	11956	12045
PRICES AND WAGES-ANNUAL RATES OF CHANGE								
GDP Deflator	1.9	1.5	2.5	2.3	2.1	2.0	2.0	2.1
CPI-All Urban Consumers	2.9	-2.2	2.0	2.4	2.5	2.3	2.3	2.2
PPI-Finished Goods	0.2	-3.3	3.0	2.0	2.3	2.2	2.2	2.3
Employment Cost Index—Total Comp	3.6	3.2	3.0	3.0	3.1	3.1	3.2	3.2
Productivity	-0.1	3.0	2.0	2.2	2.2	2.0	2.0	2.2
PRODUCTION AND OTHER KEY MEASURES								
Industrial Prod. (% Change, Annualized)	4.0	-0.5	0.5	2.3	2.0	2.0	2.1	2.3
Factory Operating Rate (%)	80.9	80.2	80.0	80.0	80.0	79.9	79.8	80.0
Nonfarm Inven. Change (2000 Chain Weighted $)	53.3	33.4	34.9	34.2	28.6	28.7	22.7	25.3
Housing Starts (Mill. Units)	1.71	1.56	1.58	1.55	1.55	1.57	1.58	1.58
Existing House Sales (Mill. Units)	6.28	6.24	6.25	6.15	6.00	5.90	5.90	5.95
Total Light Vehicle Sales (Mill. Units)	16.6	16.3	16.4	16.4	16.5	16.5	16.6	16.6
National Unemployment Rate (%)	4.7	4.5	4.6	4.6	4.6	4.7	4.7	4.7
Federal Budget Surplus (Unified, FY, $Bill)	-41.7	-80.4	-130.0	45.0	-55.0	-75.0	-125.0	15.0
Price of Oil ($Bbl., U.S. Refiners' Cost)	65.12	54.66	54.25	57.00	55.75	56.00	56.50	55.75
MONEY AND INTEREST RATES								
3-Month Treasury Bill Rate (%)	4.9	4.9	5.0	5.0	4.9	4.9	4.9	4.9
Federal Funds Rate (%)	5.2	5.2	5.3	5.3	5.3	5.2	5.0	5.0
10-Year Treasury Note Rate (%)	4.9	4.6	4.8	4.8	4.9	4.9	5.0	5.0
Long-Term Treasury Bond Rate (%)	5.0	4.7	4.9	4.9	5.0	5.1	5.1	5.2
AAA Corporate Bond Rate (%)	5.7	5.4	5.4	5.4	5.5	5.6	5.7	5.7
Prime Rate (%)	8.2	8.2	8.3	8.3	8.3	8.2	8.0	8.0
INCOMES								
Personal Income (Annualized % Change)	5.9	4.9	6.0	6.0	5.7	5.5	5.6	5.7
Real Disp. Inc. (Annualized % Change)	4.1	5.4	4.5	4.0	3.5	3.7	3.8	4.0
Personal Savings Rate (%)	-1.2	-1.0	-0.8	-0.7	-0.6	-0.5	-0.4	-0.1
Corporate Economic Profits (Annualized $Bill)	1653	1659	1726	1719	1752	1742	1830	1839
Yr-to-Yr % Change	30.6	19.1	10.0	8.0	6.0	5.0	6.0	7.0
COMPOSITION OF REAL GDP-ANNUAL RATES OF CHANGE								
Gross Domestic Product	2.0	3.5	2.7	2.7	2.9	3.0	3.0	3.0
Final Sales	1.9	4.2	2.5	2.8	3.0	3.0	3.2	3.1
Total Consumption	2.8	4.4	3.3	2.9	2.8	2.9	3.0	3.0
Nonresidential Fixed Investment	10.0	-0.4	7.0	8.0	5.0	4.0	4.0	4.5
Structures	15.7	2.8	10.0	12.0	5.0	1.0	2.0	3.0
Equipment & Software	7.7	-1.8	6.0	7.0	7.0	6.0	5.5	5.0
Residential Fixed Investment	-18.6	-19.2	-15.0	-12.0	-6.0	-2.0	3.0	4.0
Exports	6.8	10.0	7.5	8.4	8.3	8.6	8.5	8.4
Imports	5.6	-3.2	7.0	3.7	4.6	4.7	4.3	3.6
Federal Government	1.3	4.5	3.3	2.3	3.3	1.6	1.1	1.0
State & Local Governments	1.9	3.3	2.8	1.4	2.1	2.2	1.5	1.5

Value Line Forecast for the U.S. Economy

	ACTUAL				*ESTIMATED*					
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
GROSS DOMESTIC PRODUCT AND ITS COMPONENTS (2000 CHAIN WEIGHTED $) BILLIONS OF DOLLARS										
Final Sales	10036	10285	10648	11025	*11370*	*11696*	*12047*	*12421*	*12806*	*13215*
Total Consumption	7099	7295	7577	7841	*8092*	*8354*	*8605*	*8872*	*9155*	*9458*
Nonresidential Fixed Investment	1072	1082	1146	1224	*1315*	*1387*	*1447*	*1512*	*1573*	*1640*
Structures	254	244	249	252	*274*	*299*	*305*	*308*	*314*	*322*
Equipment & Software	820	843	904	985	*1051*	*1099*	*1164*	*1240*	*1315*	*1407*
Residential Fixed Investment	470	509	560	608	*582*	*503*	*518*	*536*	*563*	*602*
Exports	1013	1026	1120	1196	*1302*	*1409*	*1530*	*1665*	*1798*	*1924*
Imports	1485	1545	1711	1815	*1920*	*1986*	*2073*	*2185*	*2308*	*2437*
Federal Government	643	687	717	728	*742*	*760*	*771*	*770*	*774*	*772*
State & Local Governments	1216	1218	1224	1230	*1257*	*1287*	*1309*	*1327*	*1343*	*1359*
Gross Domestic Product	10470	10961	11712	12456	*13254*	*13916*	*14613*	*15379*	*16193*	*17080*
Real GDP (2000 Chain Weighted $)	10049	10301	10704	11049	*11422*	*11741*	*12093*	*12480*	*12880*	*13305*
PRICES AND WAGES-ANNUAL RATES OF CHANGE										
GDP Deflator	1.7	2.1	2.8	3.0	*2.9*	*2.2*	*2.1*	*2.1*	*2.2*	*2.3*
CPI-All Urban Consumers	1.6	2.3	2.7	3.4	*3.2*	*2.3*	*2.3*	*2.4*	*2.4*	*2.5*
PPI-Finished Goods	-1.3	3.2	3.6	4.9	*2.9*	*2.4*	*2.5*	*2.3*	*2.2*	*2.3*
Employment Cost Index—Total Comp.	3.8	3.8	3.8	3.1	*2.9*	*3.1*	*3.3*	*3.4*	*3.5*	*3.6*
Productivity	4.3	3.9	3.4	2.7	*2.1*	*2.1*	*2.2*	*2.2*	*2.3*	*2.3*
PRODUCTION AND OTHER KEY MEASURES										
Industrial Prod (% Change)	-0.3	0.6	4.1	3.2	*4.1*	*1.8*	*2.2*	*2.5*	*2.6*	*2.7*
Factory Operating Rate (%)	73.5	73.7	77.1	78.9	*80.4*	*80.0*	*79.8*	*79.9*	*80.0*	*80.2*
Nonfarm Inven. Change (2000 Chain Weighted $)	15.2	14.0	47.0	19.6	*43.9*	*45.0*	*30.0*	*40.0*	*42.0*	*45.0*
Housing Starts (Mill. Units)	1.71	1.85	1.95	2.07	*1.82*	*1.56*	*1.60*	*1.65*	*1.75*	*1.85*
Existing House Sales (Mill. Units)	5.65	6.18	6.72	7.06	*6.50*	*6.08*	*5.95*	*6.00*	*6.20*	*6.40*
Total Light Vehicle Sales (Mill. Units)	16.8	16.6	16.9	16.9	*16.5*	*16.5*	*16.7*	*16.8*	*17.0*	*17.3*
National Unemployment Rate (%)	5.8	6.0	5.5	5.1	*4.6*	*4.6*	*4.7*	*4.7*	*4.7*	*4.6*
Federal Budget Surplus (Unified, FY, $Bill)	-157.8	-377.0	-413.0	-318.0	*-248.0*	*-260.0*	*-230.0*	*-225.0*	*-195.0*	*-145.0*
Price of Oil ($Bbl., U.S. Refiners' Cost)	24.00	28.60	36.91	50.31	*60.12*	*55.75*	*56.00*	*56.00*	*53.00*	*50.00*
MONEY AND INTEREST RATES										
3-Month Treasury Bill Rate (%)	1.6	1.0	1.4	3.1	*4.7*	*5.0*	*4.9*	*4.9*	*5.0*	*5.1*
Federal Funds Rate (%)	1.7	1.1	1.4	3.2	*5.0*	*5.3*	*5.0*	*5.2*	*5.3*	*5.5*
10-Year Treasury Note Rate (%)	4.6	4.0	4.3	4.3	*4.8*	*4.9*	*5.1*	*5.3*	*5.5*	*5.6*
Long-Term Treasury Bond Rate (%)	5.4	5.0	5.1	4.6	*4.9*	*5.0*	*5.2*	*5.5*	*5.7*	*5.8*
AAA Corporate Bond Rate (%)	6.5	5.7	5.6	5.2	*5.6*	*5.5*	*5.8*	*6.2*	*6.4*	*6.5*
Prime Rate (%)	4.7	4.1	4.3	6.2	*8.0*	*8.3*	*8.0*	*8.0*	*8.2*	*8.3*
INCOMES										
Personal Income (% Change)	1.8	3.2	6.2	5.2	*6.4*	*5.8*	*5.7*	*5.0*	*5.8*	*6.0*
Real Disp. Inc. (% Change)	3.1	2.2	3.6	1.2	*2.7*	*3.9*	*3.5*	*3.7*	*3.6*	*3.5*
Personal Savings Rate (%)	2.4	2.1	2.0	-0.4	*-1.0*	*-0.7*	*-0.2*	*0.4*	*0.8*	*1.0*
Corporate Economic Profits ($Bill)	886	993	1183	1331	*1618*	*1735*	*1839*	*1931*	*2066*	*2231*
Yr-to-Yr % Change	15.5	12.1	19.1	12.5	*21.6*	*7.2*	*6.0*	*5.0*	*7.0*	*8.0*
COMPOSITION OF REAL GDP-ANNUAL RATES OF CHANGE										
Gross Domestic Product	1.6	2.5	3.9	3.2	*3.4*	*2.8*	*3.0*	*3.2*	*3.2*	*3.3*
Final Sales	1.2	2.5	3.5	3.5	*3.1*	*2.9*	*3.0*	*3.1*	*3.1*	*3.2*
Total Consumption	2.7	2.8	3.9	3.5	*3.2*	*3.2*	*3.0*	*3.1*	*3.2*	*3.3*
Nonresidential Fixed Investment	-9.2	1.0	5.9	6.8	*7.4*	*5.5*	*4.3*	*4.5*	*4.0*	*4.3*
Structures	-17.0	-4.1	2.2	1.1	*9.1*	*9.2*	*2.0*	*1.0*	*2.0*	*2.5*
Equipment & Software	-6.2	2.8	7.3	8.9	*6.7*	*4.5*	*6.0*	*6.5*	*6.0*	*7.0*
Residential Fixed Investment	4.9	8.4	9.9	8.6	*-4.2*	*-13.6*	*3.0*	*3.5*	*5.0*	*7.0*
Exports	-2.3	1.3	9.2	6.8	*8.9*	*8.2*	*8.6*	*8.8*	*8.0*	*7.0*
Imports	3.4	4.1	10.8	6.1	*5.8*	*3.4*	*4.4*	*5.4*	*5.6*	*5.6*
Federal Government	7.0	6.8	4.3	1.5	*2.0*	*2.4*	*1.4*	*-0.1*	*0.5*	*-0.2*
State & Local Governments	3.1	0.2	0.5	0.5	*2.1*	*2.4*	*1.7*	*1.4*	*1.2*	*1.2*

KENTUCKY-AMERICAN WATER COMPANY
CASE NO: 2007-00143
COST OF CAPITAL SUMMARY AT CURRENT AND PROPOSED RATES
13 MONTH AVERAGE

DATA: ___ BASE PERIOD _X_ FORECASTED PERIOD
DATE OF CAPITAL STRUCTURE: AVERAGE FOR FORECASTED PERIOD
TYPE OF FILING: _X_ ORIGINAL ___ UPDATED __ REVISED
WORKPAPER REFERENCE NO(S).: W/P-7

SCHEDULE J-1.1/J-1.2
PAGE 1 of 1
Witness Responsible: M.A. Miller

Line No.	Class of Capital		13 Month Average Amount	% of Total	Add (1)	Adjusted Capital	Cost Rate	Average Weighted Cost
2	Short-Term Debt		$8,036,966	3.889%	$ 42,153	$8,079,119	5.250%	0.20%
4	Long-Term Debt		103,387,163	50.031%	542,282	103,929,445	6.580%	3.29%
6	Preferred Stock		5,944,726	2.877%	31,184	5,975,910	7.750%	0.22%
8	Common Equity		89,276,928	43.203%	468,274	89,745,202	11.400%	4.93%
10	Total Capital		$206,645,783	100.000%	$ 1,083,893	$207,729,676		8.64%
16	(1) JDITC:	$ 1,083,892						

KENTUCKY-AMERICAN WATER COMPANY
CASE NO: 2007-00143
OVERALL FINANCIAL SUMMARY
November 30, 2008

DATA: ___ BASE PERIOD _X_ FORECASTED PERIOD
DATE OF CAPITAL STRUCTURE: END OF FORECASTED TEST YEAR
TYPE OF FILING: _X_ ORIGINAL ___ UPDATED __ REVISED
WORKPAPER REFERENCE NO(S).: W/P-7

SCHEDULE J-1
PAGE 1 of 2
Witness Responsible: M.A. Miller

Line No.	Class of Capital	Reference	Net Carrying Amount	% of Total	Add (1)	Adjusted Capital	Cost Rate	Terminal Weighted Cost	13 Month Average Weighted Cost
1									
2	Short-Term Debt	J-2, Page 1	$1,439,023	0.600%	$6,272	$1,445,295	5.250%	0.030%	0.200%
3									
4	Long-Term Debt	J-3, Page 1	119,899,986	53.200%	556,112	120,456,098	6.460%	3.440%	3.290%
5									
6	Preferred Stock	J-4, Page 1	5,945,110	2.600%	27,178	5,972,288	7.750%	0.200%	0.220%
7									
8	Common Equity		98,257,453	43.600%	455,762	98,713,215	11.400%	4.970%	4.930%
9									
10	Total Capital		$225,541,572	100.000%	$ 1,045,324	$226,586,896		8.640%	8.640%
11									
12									
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16	(1) JDITC	$ 1,045,324							
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KENTUCKY-AMERICAN WATER COMPANY
CASE NO: 2007-00143
COST OF CAPITAL SUMMARY
AS OF JULY 31, 2007

DATA: _X_ BASE PERIOD ___ FORECASTED PERIOD
DATE OF CAPITAL STRUCTURE: AS OF END OF BASE PERIOD
TYPE OF FILING: _X_ ORIGINAL ___ UPDATED __ REVISED
WORKPAPER REFERENCE NO(S).: W/P-7

SCHEDULE J-1
PAGE 2 of 2
Witness Responsible: M.A. Miller

Line No.	Class of Capital	Reference	Amount	% of Total	Add (1)	Adjusted Capital	Cost Rate	Terminal Weighted Cost
1								
2	Short-Term Debt	J-2, Page 2	$51,725,825	28.652%	$ 328,974	$52,054,799	5.250%	1.500%
3								
4	Long-Term Debt	J-3, Page 2	49,502,222	27.421%	314,840	49,817,062	6.550%	1.800%
5								
6	Preferred Stock	J-4, Page 2	5,944,086	3.293%	37,809	5,981,895	7.750%	0.260%
7								
8	Common Equity		73,357,159	40.634%	466,549	73,823,708	11.400%	4.630%
9								
10	Total Capital		$180,529,292	100.000%	$ 1,148,172	$181,677,464		8.190%
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16	(1) JDITC:	$ 1,148,172						
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KENTUCKY-AMERICAN WATER COMPANY
CASE NO: 2007-00143
EMBEDDED COST OF SHORT-TERM DEBT
FROM AUGUST 1, 2006 TO NOVEMBER 30, 2008

DATA: ___ BASE PERIOD _X_ FORECASTED PERIOD
DATE OF CAPITAL STRUCTURE: END OF FORECASTED TEST YEAR
TYPE OF FILING: _X_ ORIGINAL ___ UPDATED __ REVISED
WORKPAPER REFERENCE NO(S).: W/P-7

SCHEDULE J-2
PAGE 1 of 2
Witness Responsible: M.A. Miller

Line No.	Issue	Amount Outstanding	Interest Rate	Interest Requirement
1				
2				
3				
4	Promissory Note	$ 1,439,023	5.250%	$ 75,549
5				
6				
7	Weighted Cost of Short-Term Debt	5.250%		
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KENTUCKY-AMERICAN WATER COMPANY
CASE NO: 2007-00143
EMBEDDED COST OF SHORT-TERM DEBT
AS OF JULY 31, 2007

DATA: _X_ BASE PERIOD ___ FORECASTED PERIOD
DATE OF CAPITAL STRUCTURE: AS OF END OF BASE PERIOD
TYPE OF FILING: _X_ ORIGINAL ___ UPDATED __ REVISED
WORKPAPER REFERENCE NO(S).: W/P-7

SCHEDULE J-2
PAGE 2 of 2
Witness Responsible: M.A. Miller

Line No.	Issue	Amount Outstanding	Interest Rate	Interest Requirement
1				
2				
3				
4	Promissory Note	$51,725,825	5.250%	$2,715,606
5				
6				
7	Weighted Cost of Short-Term Debt	5.250%		
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KENTUCKY-AMERICAN WATER COMPANY
CASE NO: 2007-00143
EMBEDDED COST OF LONG-TERM DEBT
November 30, 2008

DATA: ___ BASE PERIOD _X_ FORECASTED PERIOD
DATE OF CAPITAL STRUCTURE: END OF FORECASTED TEST YEAR
TYPE OF FILING: _X_ ORIGINAL ___ UPDATED __ REVISED
WORKPAPER REFERENCE NO(S).: W/P-7

SCHEDULE J-3
PAGE 1 of 2
Witness Responsible: M.A. Miller

No.	Debt Issue Type & Rate	Issue Date	Maturity Date	Amount Outstanding	Cost Rate at Issue	Cost Rate at Maturity	Bond Rating at Issue	Annualized Interest	Principal Amount	Annual Amort. of Issue Expense	Unamortized Discount or Premium	Unamortized Debt Expense	Unamortized Gain/Loss	Carrying Value
1														
2														
3	General Mortgage Bonds:													
4														
5	Series 6.87%	03/30/01	03/29/11	9,300,000	6.870%	7.542%	N/A	701,406	9,300,000	62,496	0	145,814	0	9,154,186
6	Series 6.96%	12/01/93	12/01/23	7,000,000	6.960%	7.007%	N/A	490,490	7,000,000	3,264	0	48,955	0	6,951,045
7	Series 7.15%	02/14/97	02/01/27	7,500,000	7.150%	7.182%	N/A	538,650	7,500,000	2,424	0	44,138	0	7,455,862
8	Series 6.99%	09/01/98	06/01/28	9,000,000	6.990%	7.026%	N/A	632,340	9,000,000	3,264	0	63,607	0	8,936,393
9	Series 5.65%	6/12/2002	6/12/2007	0	5.650%	0.000%	N/A	0	0	0	0	0	0	0
10	Series 4.75%	3/1/2004	3/1/2014	14,000,000	4.750%	4.750%	N/A	665,000	14,000,000	0	0	0	0	14,000,000
11	Proposed 5.81%	10/01/07	10/01/17	50,000,000	5.810%	6.200%	N/A	3,100,000	50,000,000	195,000	0	2,288,750	0	47,711,250
12	Proposed 5.81%	03/01/08	03/01/18	10,000,000	5.810%	6.185%	N/A	618,500	10,000,000	37,500	0	466,667	0	9,533,333
13	Proposed 5.81%	10/1/2008	10/1/2018	17,000,000	5.810%	5.903%	N/A	1,003,510	17,000,000	15,833	0	842,083		16,157,917
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25														
26	Total Long-Term Debt and Annualized Cost			$123,800,000				$7,749,896	$ 123,800,000	$319,781	$0	$3,900,014	$0	$119,899,986
27														
28														
29	Annualized Cost Rate			6.460%										
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KENTUCKY-AMERICAN WATER COMPANY
CASE NO: 2007-00143
EMBEDDED COST OF LONG-TERM DEBT
AS OF JULY 31, 2007

DATA: _X_ BASE PERIOD ___ FORECASTED PERIOD
DATE OF CAPITAL STRUCTURE: AS OF END OF BASE PERIOD
TYPE OF FILING: _X_ ORIGINAL ___ UPDATED __ REVISED
WORKPAPER REFERENCE NO(S).: W/P-7

SCHEDULE J-3
PAGE 2 of 2
Witness Responsible: M.A. Miller

Line No.	Debt Issue Type & Rate	Issue Date	Maturity Date	Amount Outstanding	Cost Rate at Issue	Cost Rate at Maturity	Bond Rating at Issue	Annualized Interest	Principal Amount	Annual Amort. of Issue Expense	Unamortized Discount or Premium	Unamortized Debt Expense	Unamortized Gain/Loss	Carrying Value
1														
2														
3	General Mortgage Bonds:													
4	0	01/00/00	01/00/00	$0	0.000%	0.000%	N/A	$0	$0	$0	$0	$ -	$ -	$0
5	Series 6.87%	03/30/01	03/29/11	12,400,000	6.870%	7.374%	N/A	914,376	12,400,000	62,496	0	229,142	0	12,170,858
6	Series 6.96%	12/01/93	12/01/23	7,000,000	6.960%	7.007%	N/A	490,490	7,000,000	3,264	0	53,307	0	6,946,693
7	Series 7.15%	02/14/97	02/01/27	7,500,000	7.150%	7.182%	N/A	538,650	7,500,000	2,424	0	47,370	0	7,452,630
8	Series 6.99%	09/01/98	06/01/28	9,000,000	6.990%	7.026%	N/A	632,340	9,000,000	3,264	0	67,959	0	8,932,041
9	Series 5.65%	06/12/02	06/12/07	0	5.650%	0.000%	N/A	0	0	0	0	0	0	0
10	Series 4.75%	03/01/04	03/01/14	14,000,000	4.750%	4.750%	N/A	665,000	14,000,000	0	0	0	0	14,000,000
11	Proposed 5.81%	10/01/07	10/01/17	0	5.810%	0.000%	N/A	0	0	0	0	0	0	0
12	Proposed 5.81%	03/01/08	03/01/18	0	5.810%	0.000%	N/A	0	0	0	0	0	0	0
13	Proposed 5.81%	10/01/08	10/01/18	0	5.810%	0.000%	N/A	0	0	0	0	0	0	0
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25														
26	Total Long-Term Debt and Annualized Cost			$49,900,000				$3,240,856	$49,900,000	$71,448	$0	$397,778	$0	$49,502,222
27														
28														
29	Annualized Cost Rate			6.550%										
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KENTUCKY-AMERICAN WATER COMPANY
CASE NO: 2007-00143
EMBEDDED COST OF PREFERRED STOCK
November 30, 2008

DATA: ___ BASE PERIOD _X_ FORECASTED PERIOD
DATE OF CAPITAL STRUCTURE: END OF FORECASTED TEST YEAR
TYPE OF FILING: _X_ ORIGINAL ___ UPDATED __ REVISED
WORKPAPER REFERENCE NO(S).: W/P-7

SCHEDULE J-4
PAGE 1 of 2
Witness Responsible: M.A. Miller

Line No.	Dividend Rate, Type & Par Value	Date Issued	Amount Outstanding	Premium or Discount	Unamortized Issue Expense	Gain or Loss on Reaquired Stock	Net Proceeds	Annual Amort. of Issue Expense	Cost Rate at Issue	Cost Rate at Maturity	Annualized Dividends
1											
2											
3											
4											
5	Series B, 5 3/4%, $100 Par	11/21/57	391,800	0	0	0	391,800	0	5.750%	5.750%	22,529
6											
7	Series C, 5 1/2%, $100 Par	11/22/63	488,300	0	0	0	488,300	0	5.500%	5.500%	26,857
8											
9	Series D, 5%, $100 Par	05/10/63	586,600	0	0	0	586,600	0	5.000%	5.000%	29,330
10											
11											
12											
13	8.47% Series, $100 Par	01/24/92	4,500,000	0	21,590	0	4,478,410	768	8.470%	8.528%	381,919
14											
15											
16											
17											
18	Total		$5,966,700	$0	$21,590	$0	$5,945,110	$768			$460,635
19											
20											
21	Annualized Cost Rate		7.750%								
22											
23											
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KENTUCKY-AMERICAN WATER COMPANY
CASE NO: 2007-00143
EMBEDDED COST OF PREFERRED STOCK
AS OF JULY 31, 2007

DATA: _X_ BASE PERIOD ___ FORECASTED PERIOD
DATE OF CAPITAL STRUCTURE: AS OF END OF BASE PERIOD
TYPE OF FILING: _X_ ORIGINAL ___ UPDATED __ REVISED
WORKPAPER REFERENCE NO(S).: W/P-7

SCHEDULE J-4
PAGE 2 of 2
Witness Responsible: M.A. Miller

Line No.	Dividend Rate, Type & Par Value	Date Issued	Amount Outstanding	Premium or Discount	Unamortized Issue Expense	Gain or Loss on Reaquired Stock	Net Proceeds	Annual Amort. of Issue Expense	Cost Rate at Issue	Cost Rate at Maturity	Annualized Dividends
5	Series B, 5 3/4%, $100 Par	11/21/57	391,800	0	0	0	391,800	0	5.750%	5.750%	22,529
7	Series C, 5 1/2%, $100 Par	11/22/63	488,300	0	0	0	488,300	0	5.500%	5.500%	26,857
9	Series D, 5%, $100 Par	05/10/63	586,600	0	0	0	586,600	0	5.000%	5.000%	29,330
13	8.47% Series, $100 Par	01/24/92	4,500,000	0	22,614	0	4,477,386	768	8.470%	8.530%	381,921
18	TOTAL		$5,966,700	$0	$22,614	$0	$5,944,086	$768			$460,637
21	Annualized Cost Rate		7.750%								

KENTUCKY-AMERICAN WATER COMPANY
LONG TERM DEBT
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Line No.	Debt Issue Type & Rate	Interest Rate	Balance @ Jan-2007	Balance @ Feb-2007	Balance @ Mar-2007	Balance @ Apr-2007	Balance @ May-2007	Balance @ Jun-2007	Balance @ Jul-2007	Balance @ Aug-2007	Balance @ Sep-2007	Balance @ Oct-2007	Balance @ Nov-2007	Balance @ Dec-2007
1														
2														
3	GENERAL MORTGAGE BONDS													
4														
5	Series 6.87%	6.870%	$ 15,500,000	15,500,000	12,400,000	12,400,000	12,400,000	12,400,000	12,400,000	12,400,000	12,400,000	12,400,000	12,400,000	12,400,000
6	Series 6.96%	6.960%	7,000,000	7,000,000	7,000,000	7,000,000	7,000,000	7,000,000	7,000,000	7,000,000	7,000,000	7,000,000	7,000,000	7,000,000
7	Series 7.15%	7.150%	7,500,000	7,500,000	7,500,000	7,500,000	7,500,000	7,500,000	7,500,000	7,500,000	7,500,000	7,500,000	7,500,000	7,500,000
8	Series 6.99%	6.990%	9,000,000	9,000,000	9,000,000	9,000,000	9,000,000	9,000,000	9,000,000	9,000,000	9,000,000	9,000,000	9,000,000	9,000,000
9	Series 5.65%	5.650%	24,000,000	24,000,000	24,000,000	24,000,000	24,000,000	0	0	0	0	0	0	0
10	Series 4.75%	4.750%	14,000,000	14,000,000	14,000,000	14,000,000	14,000,000	14,000,000	14,000,000	14,000,000	14,000,000	14,000,000	14,000,000	14,000,000
11	Proposed 5.81%	5.810%	0	0	0	0	0	0	0	0	0	50,000,000	50,000,000	50,000,000
12	Proposed 5.81%	5.810%	0	0	0	0	0	0	0	0	0	0	0	0
13	Proposed 5.81%	5.810%	0	0	0	0	0	0	0	0	0	0	0	0
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27	TOTAL		$ 77,000,000	$ 77,000,000	$ 73,900,000	$ 73,900,000	$ 73,900,000	$ 49,900,000	$ 49,900,000	$ 49,900,000	$ 49,900,000	$ 99,900,000	$ 99,900,000	$ 99,900,000
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KENTUCKY-AMERICAN WATER COMPANY
LONG TERM DEBT
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Line No.	Debt Issue Type & Rate	Interest Rate	Balance @ Jan-2008	Balance @ Feb-2008	Balance @ Mar-2008	Balance @ Apr-2008	Balance @ May-2008	Balance @ Jun-2008	Balance @ Jul-2008	Balance @ Aug-2008	Balance @ Sep-2008	Balance @ Oct-2008	Balance @ Nov-2008	13 Month Average
1														
2														
3	GENERAL MORTGAGE BONDS													
4														
5	Series 6.87%	6.870%	12,400,000	12,400,000	9,300,000	9,300,000	9,300,000	9,300,000	9,300,000	9,300,000	9,300,000	9,300,000	9,300,000	10,253,846
6	Series 6.96%	6.960%	7,000,000	7,000,000	7,000,000	7,000,000	7,000,000	7,000,000	7,000,000	7,000,000	7,000,000	7,000,000	7,000,000	7,000,000
7	Series 7.15%	7.150%	7,500,000	7,500,000	7,500,000	7,500,000	7,500,000	7,500,000	7,500,000	7,500,000	7,500,000	7,500,000	7,500,000	7,500,000
8	Series 6.99%	6.990%	9,000,000	9,000,000	9,000,000	9,000,000	9,000,000	9,000,000	9,000,000	9,000,000	9,000,000	9,000,000	9,000,000	9,000,000
9	Series 5.65%	5.650%	0	0	0	0	0	0	0	0	0	0	0	0
10	Series 4.75%	4.750%	14,000,000	14,000,000	14,000,000	14,000,000	14,000,000	14,000,000	14,000,000	14,000,000	14,000,000	14,000,000	14,000,000	14,000,000
11	Proposed 5.81%	5.810%	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000
12	Proposed 5.81%	5.810%	0	0	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	6,923,077
13	Proposed 5.81%	5.810%	0	0	0	0	0	0	0	0	0	17,000,000	17,000,000	2,615,385
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26														
27	TOTAL		$ 99,900,000	$ 99,900,000	$106,800,000	$106,800,000	$106,800,000	$106,800,000	$ 106,800,000	$ 106,800,000	$ 106,800,000	$ 123,800,000	$ 123,800,000	$107,292,308
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KENTUCKY-AMERICAN WATER COMPANY
UNAMORTIZED DEBT EXPENSE

Line No.	Debt Issue Type & Rate	Balance @ Jan-2007	Balance @ Feb-2007	Balance @ Mar-2007	Balance @ Apr-2007	Balance @ May-2007	Balance @ Jun-2007	Balance @ Jul-2007	Balance @ Aug-2007	Balance @ Sep-2007	Balance @ Oct-2007	Balance @ Nov-2007	Balance @ Dec-2007
1													
2													
3	GENERAL MORTGAGE BONDS												
4													
5	Series 6.87%	260,390	255,182	249,974	244,766	239,558	234,350	229,142	223,934	218,726	213,518	208,310	203,102
6	Series 6.96%	39,233	39,039	38,845	38,651	38,457	38,263	38,069	37,875	37,681	37,487	37,293	37,099
7	Series 7.15%	48,582	48,380	48,178	47,976	47,774	47,572	47,370	47,168	46,966	46,764	46,562	46,360
8	Series 6.99%	69,591	69,319	69,047	68,775	68,503	68,231	67,959	67,687	67,415	67,143	66,871	66,599
9	Series 5.65%	217	163	109	55	0	0	0	0	0	0	0	0
10	Series 4.75%	0	0	0	0	0	0	0	0	0	0	0	0
11	Proposed 5.81%	0	0	0	0	0	0	0	0	0	2,500,000	2,483,750	2,467,500
12	Proposed 5.81%	0	0	0	0	0	0	0	0	0	0	0	0
13	Proposed 5.81%												
14	Series 8.5% w/o over life of 6.96% issu	15706	15,628	15,550	15,472	15,394	15,316	15,238	15,160	15,082	15,004	14,926	14,848
15													
16													
17													
18	0												
19													
20													
21	TOTAL	$ 433,719	$ 427,711	$ 421,703	$ 415,695	$ 409,686	$ 403,732	$ 397,778	$ 391,824	$ 385,870	$ 2,879,916	$ 2,857,712	$ 2,835,508
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KENTUCKY-AMERICAN WATER COMPANY
UNAMORTIZED DEBT EXPENSE

Line No.	Debt Issue Type & Rate	Balance @ Jan-2008	Balance @ Feb-2008	Balance @ Mar-2008	Balance @ Apr-2008	Balance @ May-2008	Balance @ Jun-2008	Balance @ Jul-2008	Balance @ Aug-2008	Balance @ Sep-2008	Balance @ Oct-2008	Balance @ Nov-2008	13 Month Average
1													
2													
3	GENERAL MORTGAGE BONDS												
4													
5	Series 6.87%	197,894	192,686	187,478	182,270	177,062	171,854	166,646	161,438	156,230	151,022	145,814	177,062
6	Series 6.96%	36,905	36,711	36,517	36,323	36,129	35,935	35,741	35,547	35,353	35,159	34,965	36,129
7	Series 7.15%	46,158	45,956	45,754	45,552	45,350	45,148	44,946	44,744	44,542	44,340	44,138	45,350
8	Series 6.99%	66,327	66,055	65,783	65,511	65,239	64,967	64,695	64,423	64,151	63,879	63,607	65,239
9	Series 5.65%	0	0	0	0	0	0	0	0	0	0	0	0
10	Series 4.75%	0	0	0	0	0	0	0	0	0	0	0	0
11	Proposed 5.81%	2,451,250	2,435,000	2,418,750	2,402,500	2,386,250	2,370,000	2,353,750	2,337,500	2,321,250	2,305,000	2,288,750	2,386,250
12	Proposed 5.81%	0	0	500,000	495,833	491,667	487,500	483,333	479,167	475,000	470,833	466,667	334,615
13	Proposed 5.81%										850,000	842,083	846,042
14	Series 8.5% w/o over life of 6.96% issu	14,770	14,692	14,614	14,536	14,458	14,380	14,302	14,224	14,146	14,068	13,990	14,458
15													
16													
17													
18	0												
19													
20													
21	TOTAL	$ 2,813,304	$ 2,791,100	$ 3,268,896	$ 3,242,525	$ 3,216,155	$ 3,189,784	$ 3,163,413	$ 3,137,043	$ 3,110,672	$ 3,934,301	$ 3,900,014	$ 3,905,145
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KENTUCKY-AMERICAN WATER COMPANY
LONG TERM DEBT EXPENSE AMORTIZATION

Line No.	Debt Issue Type & Rate	Amount @ Jan-2007	Amount @ Feb-2007	Amount @ Mar-2007	Amount @ Apr-2007	Amount @ May-2007	Amount @ Jun-2007	Amount @ Jul-2007	Amount @ Aug-2007	Amount @ Sep-2007	Amount @ Oct-2007	Amount @ Nov-2007	Amount @ Dec-2007
1													
2													
3	GENERAL MORTGAGE BONDS												
4													
5	Series 6.87%	5,208	5,208	5,208	5,208	5,208	5,208	5,208	5,208	5,208	5,208	5,208	5,208
6	Series 6.96%	194	194	194	194	194	194	194	194	194	194	194	194
7	Series 7.15%	202	202	202	202	202	202	202	202	202	202	202	202
8	Series 6.99%	272	272	272	272	272	272	272	272	272	272	272	272
9	Series 5.65%	54	54	54	54	54	0	0	0	0	0	0	0
10	Series 4.75%		0	0	0	0	0	0	0	0	0	0	0
11	Proposed 5.81%		0	0	0	0	0	0	0	0	16,250	16,250	16,250
12	Proposed 5.81%		0	0	0	0	0	0	0	0	0	0	0
13	Proposed 5.81%												
14	Series 8.5% w/o over life of 6.96% issu	78	78	78	78	78	78	78	78	78	78	78	78
15	0												
16	0												
17	0												
18	0												
19	0												
20	0												
21													
22													
23													
24	0												
25													
26													
27	TOTAL	$ 6,008	$ 6,008	$ 6,008	$ 6,008	$ 6,008	$ 5,954	$ 5,954	$ 5,954	$ 5,954	$ 22,204	$ 22,204	$ 22,204
28													
29													
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37													
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40													
41													
42													

KENTUCKY-AMERICAN WATER COMPANY
LONG TERM DEBT EXPENSE AMORTIZATION

Line No.	Debt Issue Type & Rate		Amount @ Jan-2008	Amount @ Feb-2008	Amount @ Mar-2008	Amount @ Apr-2008	Amount @ May-2008	Amount @ Jun-2008	Amount @ Jul-2008	Amount @ Aug-2008	Amount @ Sep-2008	Amount @ Oct-2008	Amount @ Nov-2008	Test Period Total
1														
2														
3	GENERAL MORTGAGE BONDS													
4														
5	Series 6.67%		5,208	5,208	5,208	5,208	5,208	5,208	5,208	5,208	5,208	5,208	5,208	62,496
6	Series 6.96%		194	194	194	194	194	194	194	194	194	194	194	2,328
7	Series 7.15%		202	202	202	202	202	202	202	202	202	202	202	2,424
8	Series 6.99%		272	272	272	272	272	272	272	272	272	272	272	3,264
9	Series 5.65%		0	0	0	0	0	0	0	0	0	0	0	0
10	Series 4.75%		0	0	0	0	0	0	0	0	0	0	0	0
11	Proposed 5.81%		16,250	16,250	16,250	16,250	16,250	16,250	16,250	16,250	16,250	16,250	16,250	195,000
12	Proposed 5.81%		0	0	4,167	4,167	4,167	4,167	4,167	4,167	4,167	4,167	4,167	37,500
13	Proposed 5.81%					0	0	0	0	0	0	7,917	7,917	15,833
14	Series 8.5% w/o over life of 6.96% issu		78	78	78	78	78	78	78	78	78	78	78	936
15		0												
16		0												
17		0												
18		0												
19		0												
20		0												
21														
22														
23														
24		0												
25														
26														
27	TOTAL		$ 22,204	$ 22,204	$ 26,371	$ 26,371	$ 26,371	$ 26,371	$ 26,371	$ 26,371	$ 26,371	$ 34,287	$ 34,287	$ 319,781
28														
29														
30														
31														
32														
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37														
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39														
40														
41														
42														

KENTUCKY-AMERICAN WATER COMPANY
INTEREST ON LONG TERM DEBT

Line No.	Debt Issue Type & Rate	Amount @ Jan-2007	Amount @ Feb-2007	Amount @ Mar-2007	Amount @ Apr-2007	Amount @ May-2007	Amount @ Jun-2007	Amount @ Jul-2007	Amount @ Aug-2007	Amount @ Sep-2007	Amount @ Oct-2007	Amount @ Nov-2007	Amount @ Dec-2007
1													
2													
3	GENERAL MORTGAGE BONDS												
4													
5	Series 6.87%	1,064,850	1,064,850	851,880	851,880	851,880	851,880	851,880	851,880	851,880	851,880	851,880	851,880
6	Series 6.96%	487,200	487,200	487,200	487,200	487,200	487,200	487,200	487,200	487,200	487,200	487,200	487,200
7	Series 7.15%	536,250	536,250	536,250	536,250	536,250	536,250	536,250	536,250	536,250	536,250	536,250	536,250
8	Series 6.99%	629,100	629,100	629,100	629,100	629,100	629,100	629,100	629,100	629,100	629,100	629,100	629,100
9	Series 5.65%	1,356,000	1,356,000	1,356,000	1,356,000	1,356,000	0	0	0	0	0	0	0
10	Series 4.75%	665,000	665,000	665,000	665,000	665,000	665,000	665,000	665,000	665,000	665,000	665,000	665,000
11	Proposed 5.81%	0	0	0	0	0	0	0	0	0	2,905,000	2,905,000	2,905,000
12	Proposed 5.81%	0	0	0	0	0	0	0	0	0	0	0	0
13	Proposed 5.81%	0	0	0	0	0	0	0	0	0	0	0	0
14													
15													
16													
17													
18													
19													
20	TOTAL	$ 4,738,400	$ 4,738,400	$ 4,525,430	$ 4,525,430	$ 4,525,430	$ 3,169,430	$ 3,169,430	$ 3,169,430	$ 3,169,430	$ 6,074,430	$ 6,074,430	$ 6,074,430
21													
22													
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42													

KENTUCKY-AMERICAN WATER COMPANY
INTEREST ON LONG TERM DEBT

Line No.	Debt Issue Type & Rate	Amount @ Jan-2008	Amount @ Feb-2008	Amount @ Mar-2008	Amount @ Apr-2008	Amount @ May-2008	Amount @ Jun-2008	Amount @ Jul-2008	Amount @ Aug-2008	Amount @ Sep-2008	Amount @ Oct-2008	Amount @ Nov-2008	13 Month Average
1													
2													
3	GENERAL MORTGAGE BONDS												
4													
5	Series 6.87%	851,880	851,880	638,910	638,910	638,910	638,910	638,910	638,910	638,910	638,910	638,910	704,439
6	Series 6.96%	487,200	487,200	487,200	487,200	487,200	487,200	487,200	487,200	487,200	487,200	487,200	487,200
7	Series 7.15%	536,250	536,250	536,250	536,250	536,250	536,250	536,250	536,250	536,250	536,250	536,250	536,250
8	Series 6.99%	629,100	629,100	629,100	629,100	629,100	629,100	629,100	629,100	629,100	629,100	629,100	629,100
9	Series 5.65%	0	0	0	0	0	0	0	0	0	0	0	0
10	Series 4.75%	665,000	665,000	665,000	665,000	665,000	665,000	665,000	665,000	665,000	665,000	665,000	665,000
11	Proposed 5.81%	2,905,000	2,905,000	2,905,000	2,905,000	2,905,000	2,905,000	2,905,000	2,905,000	2,905,000	2,905,000	2,905,000	2,905,000
12	Proposed 5.81%	0	0	581,000	581,000	581,000	581,000	581,000	581,000	581,000	581,000	581,000	402,231
13	Proposed 5.81%	0	0	0	0	0	0	0	0	0	987,700	987,700	151,954
14													
15													
16													
17													
18													
19													
20	TOTAL	$ 6,074,430	$ 6,074,430	$ 6,442,460	$ 6,442,460	$ 6,442,460	$ 6,442,460	$ 6,442,460	$ 6,442,460	$ 6,442,460	$ 7,430,160	$ 7,430,160	$ 6,481,174
21													
22													
23													
24													
25													
26													
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42													

KENTUCKY-AMERICAN WATER COMPANY
PREFERRED STOCK

Line No.	Debt Issue Type & Rate	Interest Rate	Balance @ Jan-2007	Balance @ Feb-2007	Balance @ Mar-2007	Balance @ Apr-2007	Balance @ May-2007	Balance @ Jun-2007	Balance @ Jul-2007	Balance @ Aug-2007	Balance @ Sep-2007	Balance @ Oct-2007	Balance @ Nov-2007	Balance @ Dec-2007
1														
2														
3														
4														
5	Series B, 5 3/4%, $100 Pa	5.750%	391,800	391,800	391,800	391,800	391,800	391,800	391,800	391,800	391,800	391,800	391,800	391,800
6														
7	Series C, 5 1/2%, $100 Pa	5.500%	488,300	488,300	488,300	488,300	488,300	488,300	488,300	488,300	488,300	488,300	488,300	488,300
8														
9	Series D, 5%, $100 Par	5.000%	586,600	586,600	586,600	586,600	586,600	586,600	586,600	586,600	586,600	586,600	586,600	586,600
10														
11														
12														
13	8.47% Series, $100 Par	8.470%	4,500,000	4,500,000	4,500,000	4,500,000	4,500,000	4,500,000	4,500,000	4,500,000	4,500,000	4,500,000	4,500,000	4,500,000
14														
15														
16														
17														
18	TOTAL		5,966,700	5,966,700	5,966,700	5,966,700	5,966,700	5,966,700	5,966,700	5,966,700	5,966,700	5,966,700	5,966,700	5,966,700
19														
20														
21														
22														
23														
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41														
42														

KENTUCKY-AMERICAN WATER COMPANY
PREFERRED STOCK

Line No.	Debt Issue Type & Rate	Interest Rate	Balance @ Jan-2008	Balance @ Feb-2008	Balance @ Mar-2008	Balance @ Apr-2008	Balance @ May-2008	Balance @ Jun-2008	Balance @ Jul-2008	Balance @ Aug-2008	Balance @ Sep-2008	Balance @ Oct-2008	Balance @ Nov-2008	13 Month Average
1														
2														
3														
4														
5	Series B, 5 3/4%, $100 Pa	5.750%	391,800	391,800	391,800	391,800	391,800	391,800	391,800	391,800	391,800	391,800	391,800	391,800
6														
7	Series C, 5 1/2%, $100 Pa	5.500%	488,300	488,300	488,300	488,300	488,300	488,300	488,300	488,300	488,300	488,300	488,300	488,300
8														
9	Series D, 5%, $100 Par	5.000%	586,600	586,600	586,600	586,600	586,600	586,600	586,600	586,600	586,600	586,600	586,600	586,600
10														
11														
12														
13	8.47% Series, $100 Par	8.470%	4,500,000	4,500,000	4,500,000	4,500,000	4,500,000	4,500,000	4,500,000	4,500,000	4,500,000	4,500,000	4,500,000	4,500,000
14														
15														
16														
17														
18	TOTAL		5,966,700	5,966,700	5,966,700	5,966,700	5,966,700	5,966,700	5,966,700	5,966,700	5,966,700	5,966,700	5,966,700	5,966,700
19														
20														
21														
22														
23														
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39														
40														
41														
42														

KENTUCKY-AMERICAN WATER COMPANY
UNAMORTIZED PREFERRED STOCK EXPENSE

Line No.	Debt Issue Type & Rate	Balance @ Jan-2007	Balance @ Feb-2007	Balance @ Mar-2007	Balance @ Apr-2007	Balance @ May-2007	Balance @ Jun-2007	Balance @ Jul-2007	Balance @ Aug-2007	Balance @ Sep-2007	Balance @ Oct-2007	Balance @ Nov-2007	Balance @ Dec-2007
1													
2													
3	Series B, 5 3/4%, $100 Par	0	0	0	0	0	0	0	0	0	0	0	0
4													
5	Series C, 5 1/2%, $100 Par	0	0	0	0	0	0	0	0	0	0	0	0
6													
7	Series D, 5%, $100 Par	0	0	0	0	0	0	0	0	0	0	0	0
8													
9													
10													
11	8.47% Series, $100 Par	22,998	22,934	22,870	22,806	22,742	22,678	22,614	22,550	22,486	22,422	22,358	22,294
12													
13													
14													
15													
16													
17													
18	TOTAL	$ 22,998	$ 22,934	$ 22,870	$ 22,806	$ 22,742	$ 22,678	$ 22,614	$ 22,550	$ 22,486	$ 22,422	$ 22,358	$ 22,294
19													
20													
21													
22													
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40													
41													
42													

KENTUCKY-AMERICAN WATER COMPANY
UNAMORTIZED PREFERRED STOCK EXPENSE

Line No.	Debt Issue Type & Rate	Balance @ Jan-2008	Balance @ Feb-2008	Balance @ Mar-2008	Balance @ Apr-2008	Balance @ May-2008	Balance @ Jun-2008	Balance @ Jul-2008	Balance @ Aug-2008	Balance @ Sep-2008	Balance @ Oct-2008	Balance @ Nov-2008	13 Month Average
1													
2													
3	Series B, 5 3/4%, $100 Par	0	0	0	0	0	0	0	0	0	0	0	0
4													
5	Series C, 5 1/2%, $100 Par	0	0	0	0	0	0	0	0	0	0	0	0
6													
7	Series D, 5%, $100 Par	0	0	0	0	0	0	0	0	0	0	0	0
8													
9													
10													
11	8.47% Series, $100 Par	22,230	22,166	22,102	22,038	21,974	21,910	21,846	21,782	21,718	21,654	21,590	21,974
12													
13													
14													
15													
16													
17													
18	TOTAL	$ 22,230	$ 22,166	$ 22,102	$ 22,038	$ 21,974	$ 21,910	$ 21,846	$ 21,782	$ 21,718	$ 21,654	$ 21,590	$ 21,974
19													
20													
21													
22													
23													
24													
25													
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36													
37													
38													
39													
40													
41													
42													

KENTUCKY-AMERICAN WATER COMPANY
PREFERRED STOCK DIVIDENDS

Line No.	Debt Issue Type & Rate	Amount @ Jan-2007	Amount @ Feb-2007	Amount @ Mar-2007	Amount @ Apr-2007	Amount @ May-2007	Amount @ Jun-2007	Amount @ Jul-2007	Amount @ Aug-2007	Amount @ Sep-2007	Amount @ Oct-2007	Amount @ Nov-2007	Amount @ Dec-2007
1													
2													
3													
4													
5	Series B, 5 3/4%, $100 Par	22,529	22,529	22,529	22,529	22,529	22,529	22,529	22,529	22,529	22,529	22,529	22,529
6													
7	Series C, 5 1/2%, $100 Par	26,857	26,857	26,857	26,857	26,857	26,857	26,857	26,857	26,857	26,857	26,857	26,857
8													
9	Series D, 5%, $100 Par	29,330	29,330	29,330	29,330	29,330	29,330	29,330	29,330	29,330	29,330	29,330	29,330
10													
11													
12													
13	8.47% Series, $100 Par	381,150	381,150	381,150	381,150	381,150	381,150	381,150	381,150	381,150	381,150	381,150	381,150
14													
15													
16													
17													
18	TOTAL	$ 459,866	$ 459,866	$ 459,866	$ 459,866	$ 459,866	$ 459,866	$ 459,866	$ 459,866	$ 459,866	$ 459,866	$ 459,866	$ 459,866
19													
20													
21													
22													
23													
24													
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27													
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42													

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KENTUCKY-AMERICAN WATER COMPANY
PREFERRED STOCK DIVIDENDS

Line No.	Debt Issue Type & Rate	Amount @ Jan-2008	Amount @ Feb-2008	Amount @ Mar-2008	Amount @ Apr-2008	Amount @ May-2008	Amount @ Jun-2008	Amount @ Jul-2008	Amount @ Aug-2008	Amount @ Sep-2008	Amount @ Oct-2008	Amount @ Nov-2008	13 Month Average
1													
2													
3													
4													
5	Series B, 5 3/4%, $100 Par	22,529	22,529	22,529	22,529	22,529	22,529	22,529	22,529	22,529	22,529	22,529	22,529
6													
7	Series C, 5 1/2%, $100 Par	26,857	26,857	26,857	26,857	26,857	26,857	26,857	26,857	26,857	26,857	26,857	26,857
8													
9	Series D, 5%, $100 Par	29,330	29,330	29,330	29,330	29,330	29,330	29,330	29,330	29,330	29,330	29,330	29,330
10													
11													
12													
13	8.47% Series, $100 Par	381,150	381,150	381,150	381,150	381,150	381,150	381,150	381,150	381,150	381,150	381,150	381,150
14													
15													
16													
17													
18	TOTAL	$ 459,866	$ 459,866	$ 459,866	$ 459,866	$ 459,866	$ 459,866	$ 459,866	$ 459,866	$ 459,866	$ 459,866	$ 459,866	$ 459,866
19													
20													
21													
22													
23													
24													
25													
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32													
33													
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35													
36													
37													
38													
39													
40													
41													
42													

KENTUCKY-AMERICAN WATER COMPANY
PREFERRED STOCK EXPENSE AMORTIZATION

Line No.	Debt Issue Type & Rate	Amount @ Jan-2007	Amount @ Feb-2007	Amount @ Mar-2007	Amount @ Apr-2007	Amount @ May-2007	Amount @ Jun-2007	Amount @ Jul-2007	Amount @ Aug-2007	Amount @ Sep-2007	Amount @ Oct-2007	Amount @ Nov-2007	Amount @ Dec-2007
1													
2													
3													
4													
5	Series B, 5 3/4%, $100 Par	0	0	0	0	0	0	0	0	0	0	0	0
6													
7	Series C, 5 1/2%, $100 Par	0	0	0	0	0	0	0	0	0	0	0	0
8													
9	Series D, 5%, $100 Par	0	0	0	0	0	0	0	0	0	0	0	0
10													
11													
12													
13	8.47% Series, $100 Par	64	64	64	64	64	64	64	64	64	64	64	64
14													
15													
16													
17													
18	TOTAL	$ 64	$ 64	$ 64	$ 64	$ 64	$ 64	$ 64	$ 64	$ 64	$ 64	$ 64	$ 64
19													
20													
21													
22													
23													
24													
25													
26													
27													
28													
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39													
40													
41													
42													

KENTUCKY-AMERICAN WATER COMPANY
PREFERRED STOCK EXPENSE AMORTIZATION

Line No.	Debt Issue Type & Rate	Amount @ Jan-2008	Amount @ Feb-2008	Amount @ Mar-2008	Amount @ Apr-2008	Amount @ May-2008	Amount @ Jun-2008	Amount @ Jul-2008	Amount @ Aug-2008	Amount @ Sep-2008	Amount @ Oct-2008	Amount @ Nov-2008	Test Period Total
1													
2													
3													
4													
5	Series B, 5 3/4%, $100 Par	0	0	0	0	0	0	0	0	0	0	0	0
6													
7	Series C, 5 1/2%, $100 Par	0	0	0	0	0	0	0	0	0	0	0	0
8													
9	Series D, 5%, $100 Par	0	0	0	0	0	0	0	0	0	0	0	0
10													
11													
12													
13	8.47% Series, $100 Par	64	64	64	64	64	64	64	64	64	64	64	768
14													
15													
16													
17													
18	TOTAL	$ 64	$ 64	$ 64	$ 64	$ 64	$ 64	$ 64	$ 64	$ 64	$ 64	$ 64	$ 768
19													
20													
21													
22													
23													
24													
25													
26													
27													
28													
29													
30													
31													
32													
33													
34													
35													
36													
37													
38													
39													
40													
41													
42													

KENTUCKY-AMERICAN WATER COMPANY
SHORT TERM DEBT

Line No.		Amount @ Jan-2007	Amount @ Feb-2007	Amount @ Mar-2007	Amount @ Apr-2007	Amount @ May-2007	Amount @ Jun-2007	Amount @ Jul-2007	Amount @ Aug-2007	Amount @ Sep-2007	Amount @ Oct-2007	Amount @ Nov-2007	Amount @ Dec-2007
1													
2													
3													
4													
5													
6													
7													
8													
9													
10	PROMISSORY NOTE	$ 7,677,627	$ 9,328,586	$ 15,864,490	$ 19,006,140	$ 22,053,482	$ 49,244,134	$ 51,725,825	$ 54,160,691	$ 56,861,322	$ 426,815	$ 3,163,866	$ 7,414,309
11													
12													
13													
14													
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KENTUCKY-AMERICAN WATER COMPANY
SHORT TERM DEBT

Line No.		Amount @ Jan-2008	Amount @ Feb-2008	Amount @ Mar-2008	Amount @ Apr-2008	Amount @ May-2008	Amount @ Jun-2008	Amount @ Jul-2008	Amount @ Aug-2008	Amount @ Sep-2008	Amount @ Oct-2008	Amount @ Nov-2008	13 Month Average
1													
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10	PROMISSORY NOTE	$ 10,902,539	$ 12,387,610	$ 820,446	$ 820,446	$ 4,007,270	$ 9,206,224	$ 13,632,482	$ 17,254,649	$ 23,081,291	$ 350,408	$ 1,439,023	$ 8,036,966
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KENTUCKY-AMERICAN WATER COMPANY
COMMON EQUITY

Line No.		Amount @ Jan-2007	Amount @ Feb-2007	Amount @ Mar-2007	Amount @ Apr-2007	Amount @ May-2007	Amount @ Jun-2007	Amount @ Jul-2007	Amount @ Aug-2007	Amount @ Sep-2007	Amount @ Oct-2007	Amount @ Nov-2007	Amount @ Dec-2007
1													
2													
3	BALANCE	$ 73,228,973	$ 73,187,262	$ 73,129,635	$ 72,552,670	$ 72,577,476	$ 72,696,590	$ 72,672,394	$ 73,357,159	$ 74,088,749	$ 74,544,574	$ 84,155,537	$ 84,584,942
4													
5													
6	ADD: EQUITY INFUSION										9,000,000		
7													
8													
9	ADD: NET INCOME TO COMMON EQUIT	(41,711)	(57,627)	541,809	24,806	119,114	210,913	684,765	731,590	742,893	610,963	429,405	523,786
10													
11													
12	LESS: DIVIDENDS ON COMMON EQUITY			(1,118,774)			(235,109)			(287,068)			(1,607,773)
13													
14													
15		$ 73,187,262	$ 73,129,635	$ 72,552,670	$ 72,577,476	$ 72,696,590	$ 72,672,394	$ 73,357,159	$ 74,088,749	$ 74,544,574	$ 84,155,537	$ 84,584,942	$ 83,500,955
16													
17		73187262	73129635	72552670									
18		$ -	$ -	$ -									
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KENTUCKY-AMERICAN WATER COMPANY
COMMON EQUITY

Line No.		Amount @ Jan-2008	Amount @ Feb-2008	Amount @ Mar-2008	Amount @ Apr-2008	Amount @ May-2008	Amount @ Jun-2008	Amount @ Jul-2008	Amount @ Aug-2008	Amount @ Sep-2008	Amount @ Oct-2008	Amount @ Nov-2008	13 Month Average
1													
2													
3	BALANCE	$ 83,500,955	$ 83,804,289	$ 84,207,515	$ 88,475,794	$ 88,903,828	$ 89,407,769	$ 89,133,176	$ 90,212,302	$ 91,347,610	$ 91,359,897	$ 97,404,537	
4													
5													
6	ADD: EQUITY INFUSION			5,000,000							5,000,000		
7													
8													
9	ADD: NET INCOME TO COMMON EQUIT	$ 303,334	$ 403,226	$ 422,269	$ 428,034	$ 503,941	$ 610,157	$ 1,079,126	$ 1,135,308	$ 1,169,861	$ 1,044,640	$ 852,916	
10													
11													
12	LESS: DIVIDENDS ON COMMON EQUITY			(1,153,990)			(884,750)			(1,157,574)			
13													
14													
15		$ 83,804,289	$ 84,207,515	$ 88,475,794	$ 88,903,828	$ 89,407,769	$ 89,133,176	$ 90,212,302	$ 91,347,610	$ 91,359,897	$ 97,404,537	$ 98,257,453	$ 89,276,928
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KENTUCKY-AMERICAN WATER COMPANY
JDITC

Line No.		Amount @ Jan-2007	Amount @ Feb-2007	Amount @ Mar-2007	Amount @ Apr-2007	Amount @ May-2007	Amount @ Jun-2007	Amount @ Jul-2007	Amount @ Aug-2007	Amount @ Sep-2007	Amount @ Oct-2007	Amount @ Nov-2007	Amount @ Dec-2007
1													
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9													
10	DEFERRED ITC (JDITC - 4% AND 10%)	$ 1,186,740	$ 1,180,312	$ 1,173,884	$ 1,167,456	$ 1,161,028	$ 1,154,600	$ 1,148,172	$ 1,141,744	$ 1,135,316	$ 1,128,888	$ 1,122,460	$ 1,116,032
11													
12													
13	DEFERRED ITC - 3%	$ 108,841	$ 108,203	$ 107,565	$ 106,927	$ 106,289	$ 105,651	$ 105,013	$ 104,375	$ 103,737	$ 103,099	$ 102,461	$ 101,823
14													
15													
16	ANNUAL AMORTIZATION OF 3% ITC	$ 7,656											
17													
18	ANNUAL AMORTIZATION OF 4% ITC	$ 6,300											
19													

KENTUCKY-AMERICAN WATER COMPANY
JDITC

Line No.		Amount @ Jan-2008	Amount @ Feb-2008	Amount @ Mar-2008	Amount @ Apr-2008	Amount @ May-2008	Amount @ Jun-2008	Amount @ Jul-2008	Amount @ Aug-2008	Amount @ Sep-2008	Amount @ Oct-2008	Amount @ Nov-2008	13 Month Average
1													
2													
3													
4													
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6													
7													
8													
9													
10	DEFERRED ITC (JDITC - 4% AND 10%)	$ 1,109,604	$ 1,103,176	$ 1,096,748	$ 1,090,320	$ 1,083,892	$ 1,077,464	$ 1,071,036	$ 1,064,608	$ 1,058,180	$ 1,051,752	$ 1,045,324	$ 1,083,892
11													
12													
13	DEFERRED ITC - 3%	$ 101,185	$ 100,547	$ 99,909	$ 99,271	$ 98,633	$ 97,995	$ 97,357	$ 96,719	$ 96,081	$ 95,443	$ 94,805	$ 98,633
14													
15													
16	ANNUAL AMORTIZATION OF 3% ITC												
17													
18	ANNUAL AMORTIZATION OF 4% ITC												
19													

KENTUCKY-AMERICAN WATER COMPANY
CASE NO. 2007-00143
ATTORNEY GENERAL'S REQUEST FOR INFORMATION

Item 22 of 312

Witness: Michael A. Miller

22. RE: Mike Miller Direct Testimony. With respect to Exhibit MAM-3, please provide:

(a) All data, work papers, assumptions on costs and interest rates in all pro forma financings, and other data used to determine the cost rates for short-term debt, long-term debt, and preferred stock, and

(b) An electronic version of all supporting Schedules and work papers used to determine the senior capital costs, with all data and equations left intact.

Response:

(a) Please see the response to AGDR1, question 21. Also please see Exhibit MAM-5 and the responses to questions 20 and 21 for a full explanation of how the cost rates for additional Long-term debt and Short-term debt were determined for the forecasted test-year.

(b) Please see the response to AGDR1, question 21.

For electronic version, refer to KAW_R_AGDR1#22_061807.pdf

KENTUCKY-AMERICAN WATER COMPANY
CASE NO. 2007-00143
ATTORNEY GENERAL'S REQUEST FOR INFORMATION

Item 23 of 312

Witness: Michael A. Miller

23. RE: Mike Miller Direct Testimony. With respect to Exhibit MAM-4, please provide:

(a) All data and work papers used in the analysis of the financings, and

(b) An electronic version of all supporting Schedules and work papers used in the analysis, with all data and equations left intact.

Response:

Please see the electronic version of the workpapers and additional schedules that support Exhibit MAM-4. Please refer to KAW_R_AGDR1#23_Exhibit_MAM4_061807.xls

For electronic version of this document, refer to KAW_R_AGDR1#23_061807.pdf

KENTUCKY-AMERICAN WATER COMPANY
CASE NO. 2007-00143
ATTORNEY GENERAL'S REQUEST FOR INFORMATION

Item 24 of 312

Witness: Michael A. Miller

24. RE: Mike Miller Direct Testimony. With respect to Exhibit MAM-5, please provide:

(a) All data and work papers used in the analysis of interest rates, as well as an detailed explanation of the analysis which is performed in Exhibit MAM-5, and

(b) An electronic version of Exhibit MAM-5 (pages 1 and 2) along with all supporting Schedules and work papers used in the analysis, with all data and equations left intact.

Response:

(a) The source of all data used on Exhibit MAM-5 is the Value Line Publication from the date of publication as indicated on the Exhibit. No other workpapers or analysis was used other than as shown and noted on the Exhibit.

(b) Please refer to electronic file KAW_R_AGDR1#24_Exhibit_MAM5_061807.xls.

For electronic version of this document, refer to KAW_R_AGDR1#24_061807.pdf

KENTUCKY-AMERICAN WATER COMPANY
CASE NO. 2007-00143
ATTORNEY GENERAL'S REQUEST FOR INFORMATION

Item 25 of 312

Witness: Michael A. Miller

25. RE: Pension Assets. Please provide the following:

(a) The overall expected rate of return used for pension assets;

(b) The expected rates of return for alternative assets classes (long-term bonds, common stock) used in determining the overall expected rate of return used for pension assets; and

(c) Copies of all documentation used in determining the expected rates of return for alternative assets classes (long-term bonds, common stock).

Response:

(a) Please see the American Water Pension Plan actuarial report dated May 7, 2007 provided in response to KAW_R_PSCDR2#28b_061807.pdf which contains the requested information and all assumptions and sources used by the actuary, Towers Perrin.

(b) See the response to part a. above.

(c) See the response to part a. above.

For electronic version, refer to KAW_R_AGDR1#25_061807.pdf

KENTUCKY-AMERICAN WATER COMPANY
CASE NO. 2007-00143
ATTORNEY GENERAL'S REQUEST FOR INFORMATION

Item 26 of 312

Witness: Michael A. Miller

26. Please provide a complete bill frequency analysis (also known as a consolidation analysis), separately for each customer class, meter size, and rate division and subdivision. Please provide this analysis in one or more electronic files in one of the following formats that most closely matches the original, in an unprotected (no password) format: Microsoft Excel, Lotus 1-2-3, Microsoft Access, dBASE, SPSS, SAS, comma delimited text, ASCII text, Adobe Acrobat (not a scanned or image file).

Response:

The electronic version of the bill frequency analysis for the base period actual from August 2006 through January 2007 is titled KAW_R_AGDR1#26_billfrequency.xls.

For electronic version of this document, refer to KAW_R_AGDR1#26_061807.pdf

KENTUCKY-AMERICAN WATER COMPANY
CASE NO. 2007-00143
ATTORNEY GENERAL'S REQUEST FOR INFORMATION

Item 27 of 312

Witness: Michael A. Miller

27. Please provide the original electronic spreadsheet file used to create Exhibit 37M, with all formulas and links intact, including all files linked thereto that are necessary for the proper functioning of the file. If any of the links are to a mainframe database or application, please provide the version of the output from such database or application that was used to produce Exhibit 37M.

Response:

See the electronic files filed in response to AGDR1#46. The spreadsheet used to create Exhibit 37M is titled Rev07.xls.

For electronic version of this document, refer to KAW_R_AGDR1#27_061807.pdf

KENTUCKY-AMERICAN WATER COMPANY
CASE NO. 2007-00143
ATTORNEY GENERAL'S REQUEST FOR INFORMATION

Item 28 of 312

Witness: Michael A. Miller

28. Please provide the original electronic spreadsheet file used to create Exhibit MAM-9, with all formulas and links intact, including all files linked thereto that are necessary for the proper functioning of the file. If any of the links are to a mainframe database or application, please provide the version of the output from such database or application that was used to produce Exhibit MAM-9.

Response:

Please see KAW_R_AGDR1#57_Exhibit_MAM9_061807.xls for the electronic version of the requested information.

For electronic version of this document, refer to KAW_R_AGDR1#28_061807.pdf

KENTUCKY-AMERICAN WATER COMPANY
CASE NO. 2007-00143

ATTORNEY GENERAL'S REQUEST FOR INFORMATION

Item 29 of 312

Witness: Linda C. Bridwell

29. RE: Testimony of Linda Bridwell, p. 22, lines 1-3. The witness states that all new meter installations have AMR capabilities. Please describe the current methods by which KAWC reads meters (for example, manual, touch pad, AMR, etc.). For each such method, please state the number of meters by customer class and the approximate amount of time it takes to read each such meter.

Response:

KAW reads meters manually, via touch pad, and via AMR. The manual and touch pad meters take approximately 2.5 minutes each to read. AMR requires only walking past or driving past at the posted speed limit. KAW first deployed AMR in rural areas where two meter readers are required for safety considerations. AMR is now deployed in new residential areas and areas with large residential lots. The table below shows the number of meters by revenue class and meter type as of May 31, 2007.

REVENUE CLASS	AMR	MANUAL	TOUCH PAD	TOTAL
Residential	25,663	77,672	2,006	105,341
Commercial	2,968	5,342	4256	8,736
Industrial	36	1	7	44
Other Public Authority	452	187	79	718
Other Water Utility	6	0	17	23
Private Fire	107	708	377	1,192
TOTAL	29,232	83,910	1,112	116,054

For electronic version, refer to KAW_R_AGDR1#29_061807.pdf

KENTUCKY-AMERICAN WATER COMPANY
CASE NO. 2007-00143

ATTORNEY GENERAL'S REQUEST FOR INFORMATION

Item 30 of 312

Witness: Paul Herbert

30. RE: Testimony of Paul Herbert, p. 3, lines 13-14. The witness states: “The allocated cost of service is one of several criteria appropriate for consideration in designing customer rates to produce the required revenues.” What are the other criteria that the witness considers “appropriate for consideration” in designing rates in this case? Please list each such factor and describe how the witness considered or applied it in this case.

<u>Response</u>:

Please refer to the direct testimony of Paul Herbert, page 9, line 23 through page 10, line 5, for the other criteria appropriate to consider in designing rates. The factors considered are listed on lines 7-13 on page 10 of the testimony.

For electronic version, refer to KAW_R_AGDR1#30_061807.pdf

KENTUCKY-AMERICAN WATER COMPANY
CASE NO. 2007-00143

ATTORNEY GENERAL'S REQUEST FOR INFORMATION

Item 31 of 312

Witness: Paul Herbert

31. RE: Testimony of Paul Herbert, p. 6, lines 19-21. What is the basis for the witness's statement that purchased water, power, and chemicals "require little administrative and general expense"?

<u>Response</u>:

The basis for the statement can be found in AWWA Manual M1, page 57, which states that the allocation of administrative and general expense should be based on the allocation of all other expenses exclusive of purchased power and chemical costs. Once they have been contracted for, they require little administrative and general expense other than to pay the monthly bill.

For electronic version, refer to KAW_R_AGDR1#31_061807.pdf

KENTUCKY-AMERICAN WATER COMPANY
CASE NO. 2007-00143

ATTORNEY GENERAL'S REQUEST FOR INFORMATION

Item 32 of 312

Witness: Paul Herbert

32. RE: Testimony of Paul Herbert, p. 8, lines 8-9 and Exhibit 36, Schedule C (Factor G). Did the witness consider any other method to allocate meter reading costs (such as a method based on the cost or efficiency of reading meters for each class of customers)? If so, please provide copies of all analyses and workpapers evaluating such other methods. If not, please explain why not.

Response:

The witness considered using information that would provide an analysis of man-days to read meters by classification; however, such data was not readily available.

For electronic version, refer to KAW_R_AGDR1#32_061807.pdf