47. Q. Please explain the errors in those two approaches and how they may corrupt her CAPM results.

A. Ms. Ahern's Ibottson-based estimate is based entirely on historical data, the use of which has several short-comings, as discussed previously. Ms. Ahern's Value Line-based estimate of the required rate of return on the market contains several errors. Selecting the median as her measure of central tendency in market dividend yields and growth rates was Ms. Ahern's first error. The median of a sample is its middle value; that is, the sample contains as many values above the median as it contains below it. The magnitude of the difference between those other values and the median is not considered. For example, the median of a set comprising 1, 3 and 5 equals 3. The median of a set comprising 1, 3 and 10 also equals 3; although, the highest value in the latter set is double that in the former set. In particular, the median fails to properly weight the relative value of the securities composing the market portfolio. The common stocks of larger companies have a greater effect on the market returns because they constitute a greater proportion of the market than those of smaller companies. Nevertheless, the median growth estimate does not afford higher weights to larger companies, and thus over weights the contributions of smaller companies, which tend to have greater growth potential. Ms. Ahern's Value Line-based estimate compounds that problem by improperly drawing the median dividend yield and growth rates from two different samples. The median of estimated dividend yields is an estimate of

dividend paying stocks only. That is, common stocks that do not pay dividends were excluded from the sample from which the median dividend yield was derived. Conversely, the median appreciation projection is an estimate of all stocks in the hypothesized economic environment, dividend paying or not. Obviously the dividend yield of non-dividend paying stocks is 0%. Therefore, the median dividend yield for all common stocks included in *The Value Line Investment Survey* would be lower than that for the subset of common stocks paying dividends. Thus, by adding the higher dividend yield of dividend paying stocks alone to the estimated price appreciation of all stocks, Ms. Ahern overstates the overall return on the market.

48. Q. Please describe the errors in Ms. Ahern's Empirical CAPM analysis.

A. Quantitative research suggests the relationship between risk and return is flatter than the CAPM predicts. The Empirical CAPM attempts to reproduce the observed relationship between risk and realized returns.[35] Since the adjustments to the CAPM that result in the Empirical CAPM are based on empirical testing rather than financial theory, the Empirical CAPM should be applied in a manner that is consistent with the conditions under which it was developed. Specifically, the measure of risk used within the Empirical CAPM must be consistent with that used in the empirical studies from which the model was developed. Ms. Ahern failed in that regard. The basis of Ms. Ahern's Empirical CAPM is a book entitled *Regulatory Finance: Utilities'*

[35] CIWC Exhibit 7, pp. 39-40.

Cost of Capital by Roger A. Morin.[36] That text, in turn, cites another study by Litzenberger, et. al.[37] Litzenberger et. al. adopts raw beta as the measure of risk in its tests of the relationship between risk and realized returns. In contrast, Ms. Ahern applies to both her Traditional and Empirical CAPM models Value Line adjusted betas,[38] rather than the raw betas used in accordance with Litzenberger et. al. Importantly, Litzenberger et. al. suggest that globally adjusted betas,[39] such as those which Value Line publishes, are a solution to the discrepancy between the theoretically predicted and empirically observed relationship between risk and return.[40] In other words, by using adjusted betas, Ms. Ahern has already effectively transformed her "Traditional" CAPM into an empirical CAPM model. Therefore, including an additional beta adjustment in her "Empirical" CAPM model results in inflated estimates of her samples' cost of common equity.

49. Q. Please demonstrate how Ms. Ahern's use of Value Line betas in her Empirical CAPM inflates her estimate of her sample's cost of common equity.

A. Ms. Ahern's Empirical CAPM can be depicted mathematically as follows:[41]

[36] CIWC Exhibit 7, p. 39.
[37] Litzenberger, Ramaswamy and Sosin, "On the CAPM Approach to the Estimation of A Public Utility's Cost of Equity Capital," *Journal of Finance*, May 1980, pp. 369-383.
[38] CIWC Exhibit 7, Schedule 16, pp. 2 and 3.
[39] Litzenberger et. al. refers to betas adjusted in the manner of Merrill Lynch and Value Line as "globally adjusted."
[40] Litzenberger, Ramaswamy and Sosin, "On the CAPM Approach to the Estimation of A Public Utility's Cost of Equity Capital," *Journal of Finance*, May 1980, pp. 375-376.
[41] CIWC Exhibit 7, Schedule 16, p. 4, note (4).

691 $$R_j = R_f + 0.25 \times (R_m - R_f) + 0.75 \times \beta_j \times (R_m - R_f)$$

692 That formula can be restated as follows:

693 $$R_j = R_f + (0.25 + 0.75 \times \beta_j) \times (R_m - R_f) \qquad (1)$$

694 Consequently, the Empirical CAPM effectively substitutes a weighted
695 average beta for security *j*'s raw beta. In Ms Ahern's Empirical CAPM, the
696 weighted average beta effectively equals the sum of 0.25 times the market
697 beta of 1.0, and 0.75 times security *j*'s raw beta. Yet, Value Line betas are
698 already adjusted using the following formula:

699 $$\beta_{Value\ Line} = 0.35 + 0.67 \times \beta_{raw}$$[42]

700 Substituting the Value Line adjustment formula into the CAPM produces an
701 Empirical CAPM with slightly different parameters:

702 $$R_j = R_f + (0.35 + 0.67 \times \beta_j) \times (R_m - R_f)$$

703 Substituting Value Line betas into Ms. Ahern's Empirical CAPM in place of
704 raw betas increases the weight (compare equations (1) and (2)) of the
705 market beta (where β=1, i.e., the intercept) and reduces the weight of the raw
706 beta:

$$R_j = R_f + (0.51 + 0.50 \times \beta_j) \times (R_m - R_f) \quad (2)$$

Therefore, including Value Line adjusted betas in Ms. Ahern's Empirical CAPM leads to an overstated estimate of the cost of common equity whenever the raw beta is less than one, since the weight of raw beta is being reduced in favor of the market beta of 1.0.

Risk Premium Model

50. Q. Please explain Ms. Ahern's RPM analysis.

A. Ms. Ahern's RPM is essentially an average of two distinct risk premium models for each proxy group.[43] The following formula, derived on Schedule 7.10, depicts Ms. Ahern's RPM model as:

$$R_j = \frac{(R_{A2} + \beta_j \times RP_1) + (R_{A2} + RP_2)}{2}$$

Each model begins with the same "Adjusted Prospective Bond Yield," R_{A2} (8.3%), which, ostensibly, represents the prospective yield on bonds rated A2 by Moody's, the average credit rating of the proxy group of seven water companies. To R_{A2}, the first model adds the product of the Value Line adjusted Beta for the proxy group of seven water companies, β_j, (0.54) and

[42] Statman, "Betas compared: Merrill Lynch vs. Value Line," *Journal of Portfolio Management*, Winter 1981, pp. 41-44.

[43] For presentation purposes, I will only address the proxy group of seven water companies; however, the proxy group of eight public utility companies is conceptually the same.

the average of the historical and forecasted risk premium estimates, RP_1, (8.9%). The second model adds to R_{A2} an historical risk premium estimate, RP_2, (4.6%). Inputting Ms. Ahern's estimates[44] produces a cost of equity estimate of 13.0% as shown below:

$$R_j = \frac{(8.3\% + 0.54 \times 8.9\%) + (8.3\% + 4.6\%)}{2} = 13.0\%$$

51. Q. Please describe the shortcomings of Ms. Ahern's risk premium model.

A. In addition to the inappropriate use of historical input data, as discussed previously, both of the models incorporated into Ms. Ahern's RPM analysis are also flawed in other respects. The first model in Ms. Ahern's risk premium analysis ($R_{A2} + \beta_j \times RP_1$) is a CAPM derivation using improper proxies for the risk-free rate. There are two fundamental flaws to this approach. First, Ms. Ahern improperly applied a market risk premium-based beta to a non-market risk premium. Second, she inappropriately incorporated two different long-term corporate bond yields as substitutes for the risk-free rate within the same risk premium model. The second model in Ms. Ahern's risk premium analysis ($R_{A2} + RP_2$) is also flawed, due to the *improper derivation of the equity risk premium.*

52. Q. Please explain why the application of a market risk premium-based beta to a non-market risk premium is inappropriate.

[44] Company Exhibit 7, Schedule 15, pp.1, 6, and 8.

A. The Value Line betas used by Ms. Ahern were developed by regressing each company's excess returns over the risk-free rate (company-specific risk premium) against the excess returns of the market over the risk-free rate (market risk premium). That is, a Value Line beta is a measure of the relationship between the market risk premium and the risk premium of a given company. Beta measures relative market risk and cannot be assumed to accurately measure any other type of risk. To illustrate, the beta-based risk premium model can be depicted mathematically as follows:

$$R_j = R_{A\text{-}bond} + \beta_j \times (R_m - R_{A\text{-}bond}) \qquad (3)$$

where $R_j \equiv R_j \equiv$ the required rate of return for security j;
$R_{A\text{-}bond} \equiv R_{A\text{-}bond} \equiv$ the A-rated utility bond rate;
$R_m \equiv R_m \equiv$ the expected rate of return for the market portfolio; and
$\beta_j \equiv b_j \equiv$ the measure of risk for security j.

The above model is identical to the CAPM except that it substitutes a risky debt rate, $R_{A\text{-}bond}$, for the risk-free rate, R_f, a substitution which has no basis in financial theory. The CAPM can be expressed as:

$$R_j = [(1 - \beta_j) \times R_f] + (\beta_j \times R_m)$$

Likewise, the risk premium model can be rewritten as:

$$R_j = [(1 - \beta_j) \times R_{A\text{-}bond}] + (\beta_j \times R_m)$$

Comparing the CAPM and the risk premium models above, it is evident that since the cost of risky debt, $R_{A\text{-}bond}$, exceeds the risk-free rate, R_f, this basic risk premium model systematically underestimates the cost of equity for companies with a beta greater than one and overestimates the cost of common equity for all companies with betas less than one, which applies to all the companies in Ms. Ahern's proxy group.

53. Q. Please explain the consequences of incorporating two different long-term corporate bond yields as substitutes for the risk-free rate in a risk premium model.

A. The first of the two models averaged in Ms. Ahern's risk premium analysis differs slightly from the basic risk premium model (3) presented above, in that it substitutes two different long-term corporate bond yields for the risk-free rate within the same model. The following general model was employed by Ms. Ahern in her risk premium analysis:

$$R_j = R_{A2} + \beta_j \times (R_m - R_{Other})$$

A fundamental tenet of financial theory states that investors require identical returns from two securities with identical risk. A closer look at the above model verifies that whenever R_{Other} is not equal to R_{A2}, then the model violates that principle. To illustrate, consider a company, j, whose risk is equal to that of the market ($\beta_m = \beta_j = 1$). Financial theory posits that the expected return on company j stock should equal that of the market. Substituting a beta of one into the above formula produces:

$$R_j = R_{A2} + (R_m - R_{Other})$$

When $R_{A2} = R_{Other}$, the above formula will reduce to $R_j = R_m$, which conforms to the aforementioned tenet of financial theory. However, when $R_{A2} \neq R_{Other}$, then $R_j \neq R_m$. That is, the estimated return for security j does not equal the estimated return on the market, even although they both have the same risk level ($\beta_m = \beta_j = 1$). Ms. Ahern used an R_{A2} of 8.3% and an R_{other} of 5.9% and 7.7% (average = 6.8%), with an R_m of 13.3% and 18.0% (average = 15.65%) in her first model. This would result in an estimated return (R_j) of 17.15% for a company with a beta of one (the same as the market), although the estimated market return (R_m) is only 15.65%. Clearly, the first of the two models Ms. Ahern averaged in her RPM analysis is theoretically untenable. In fact, as long as R_{A2} is greater than R_{Other}, this model will overestimate the cost of equity for companies with a beta less than one, which includes every company in her proxy groups.

54. Q. Please explain how the equity risk premium in the second model in Ms. Ahern's risk premium analysis ($R_{A2} + RP_2$) was improperly derived.

A. To estimate the risk premium for her second model (RP_2), Ms. Ahern selected the historical measurement period of 1928-1999.[45] First, Ms. Ahern calculated a market equity risk premium by subtracting the Salomon Brothers Long-Term High Grade Corporate Bond Index yield from the S&P Public Utility Index (11.0% - 5.9% = 5.1%). Next, Ms. Ahern estimated the spread between the Salomon Brothers Long-Term High Grade Corporate Bond Index yield and A rated public utility bonds, to reflect the average rating of the

[45] Company Exhibit 7, Schedule 15, p. 8.

proxy group of seven. To do so, she subtracted the arithmetic mean yields on Aaa and Aa rated bonds (used as a proxy for the Salomon Brothers Long-Term High Grade Corporate Bond Index yield) from the yield on A rated public utility bonds (6.58% - 6.12% = 0.46%, which she rounded to 0.5%). Finally, she calculated an adjusted equity risk premium by subtracting the spread between the Salomon Brothers Long-Term High Grade Corporate Bond Index yield and A rated public utility bonds (0.5%) from the equity risk premium (5.1%).

The adjusted equity risk premium in the second of the two models averaged in Ms. Ahern's RPM analysis is inappropriate for three reasons. First, it uses historical data, which, as discussed previously, is inappropriate. Second, it overstates the equity risk premium by substituting a derived 6.4% return on A-rated utility bonds for an observable 6.6% return (rounded from 6.58%). That is, she subtracted a derived 6.4% estimate from the 11.0% equity index return, yielding 4.6%, rather than subtracting the directly observable 6.6%, which would have produced a 4.4% equity risk premium. Third, it is based upon S&P's Public Utility Index, which Ms. Ahern has not demonstrated to be comparable in risk to CIWC.

Comparable Earnings Model

55. Q. Please describe the shortcomings of Ms. Ahern's comparable earnings analysis.

A. In addition to the use of historical data, Ms. Ahern's CEM suffers several other shortcomings. First, the return estimated by the comparable earnings

analysis can be significantly distorted by accounting practices. Accounting returns between two companies may not be directly comparable, particularly if those companies are from different industries. Specifically, the accounting return between a company which follows regulatory accounting rules may not be directly comparable to the return of an unregulated company. Differences in accounting practices can have a significant impact on accounting rate of return. Since Ms. Ahern's comparison group consists of 18 non-utility companies, the comparability of earnings to the water and utility proxy groups being considered is highly questionable. Second, Ms. Ahern's comparable earnings analysis relies on the notion that a combination of realized and expected returns on book value ("accounting earnings") is an appropriate estimate for required returns, the fallacies of which are discussed below. Third, the two comparable earnings proxy samples have higher average Value Line betas, and are thus riskier, than the samples they are supposed to represent. The CEM sample representing the Water Group has a beta of 0.64, while the Water Group's beta is 0.53. The CEM sample representing the Utility Group has a beta of 0.67, while the Utility Group's beta is 0.57.[46] Thus, even if accounting earnings were representative of investor requirements, which they are not, the comparable earnings model would overstate the cost of the equity estimates for both of Ms. Ahern's proxy groups. All of the above indicate that the comparable earnings model is not an appropriate method for estimating the rate of return for CIWC.

56. Q. Please explain why returns on book value are inappropriate estimates for investor-required returns.

[46] CIWC Exhibit 7, Schedule 17, pp. 1-2.

A. The cost of common equity is the market-required rate of return demanded by investors. In contrast, Ms. Ahern's CEM is not a market-based methodology.[47] The returns Ms. Ahern uses are based on the return on net worth reported in Value Line, rather than the return on market value.[48] The comparable earnings method incorrectly implies that the rate of return on book common equity is equivalent to current investor-required rates of return. There is simply no basis for that implication since the accounting return that the comparable earnings method measures may be more or less than the return investors require from an investment. For example, if the expected return is 20% while the investor-required rate of return is only 10%, investors will bid up the price in the marketplace until the expected returns on market equity equal the required 10% return. The market price of a common stock does not achieve equilibrium until the expected rate of return on the common stock equals the investor required rate of return. In contrast, the return on book value has no such adjustment mechanism since the denominator, book value, is unresponsive to market forces.

Size-based Risk Premium

57. Q. Is Ms. Ahern's adjustment for a size-based risk premium appropriate?

A. No. First, Ms. Ahern's size-based risk premium has no theoretical basis. Rather, it is based on an empirical study that is not applicable to CIWC. Second, Ms. Ahern inappropriately applied her size-based risk premium to

[47] Despite Ms. Ahern's claim that her CEM model is market-based because "the selection of non-price regulated firms of comparable risk is based upon statistics derived from the market prices paid by investors," (CIWC Exhibit 7, p. 44) the CEM model cannot be considered market-based, as the returns estimated by her model are based on book values, which are unresponsive to market forces.

her overall analysis rather than applying it to the CAPM and RPM analyses before averaging in the DCF. Regardless, should a size-based risk premium be adopted, it should be based on the size of CIWC's parent company, Philadelphia Suburban Corporation ("PSC").[48]

58. Q. Why should the parent company be the basis for a size adjustment?

A. Although CIWC raises its own debt and preferred stock, it obtains common equity financing from its parent company, PSC. The merging of PSC and Consumers Water Company created the second largest water company in the United States based on market capitalization. Being a part of a much larger organization should enhance the ability of CIWC to access the market on reasonable terms. When utilities combine, reductions in costs resulting from efficiencies should be passed on to customers in the form of lower rates. Such economies of scale are often advanced to justify utility combinations. Financial capital costs are also subject to economies of scale. If the risk inherent in a utility common stock is a function of that utility's size, then the larger size of PSC should translate into a decreased cost of common equity, in comparison to that of a company the size of CIWC. If a risk premium were based on the size of CIWC, rate payers would be denied the benefits associated with the combined entity's stronger financial profile.

59. Q. Please explain the significance of the absence of a theoretical basis for a size-based risk premium.

[48] CIWC Exhibit 7, p. 47.

A. Since a size-based risk premium has no theoretical basis, to the extent that a correlation between firm size and return exists, that relationship is likely the result of some other factor or factors that are related to both size and return, such as liquidity or information costs. Relatively illiquid securities impose costs on the investor since he or she may be unable to sell them at a fair price on a timely basis. The securities of smaller companies tend to be less liquid than those of larger companies since the potential breadth of the market for the former is usually more limited. In addition, gathering information regarding the expected cash flows and risks of a security imposes costs that an investor must recover through the returns that the security generates. If fewer sources of information regarding smaller companies exist, then obtaining information might be more expensive.

If the securities of PSC are less liquid or the availability of information regarding PSC is more restricted than the average security, then adding a size-based premium to a risk premium or CAPM analysis of CIWC's cost of common equity might be proper. However, Ms. Ahern has not provided any theoretical or empirical evidence to demonstrate that a size premium is warranted for utilities. The study reported in Ibbotson Associates, which forms the basis of Ms. Ahern's size-based risk premium adjustment,[50] is not restricted to utilities. Rather, it is based on the stocks listed on the New York Stock Exchange.[51] In addition, the Brigham text that Ms. Ahern also cites in support of her sized-based premium adjustment[52] does not specifically refer

[49] PSC and Consumers Water Company completed their merger in March of 1999.
[50] CIWC Exhibit 7, p. 12 and Company response to Staff Data Request MGM 1.09.
[51] Ibbotson Associates, *SBBI 2000 Yearbook*, pp. 129.
[52] CIWC Exhibit 7, p. 12 and Company response to Staff Data Request MGM 1.08.

to utility stocks either. Thus, the entire basis of Ms. Ahern's size-based risk premium is questionable at best.

Utilities, unlike most stocks listed on the New York Stock Exchange, are subject to uniform reporting requirements. Furthermore, their rates and conditions of service are publicly reported. Therefore, the cost of obtaining information regarding smaller utilities in general, and CIWC in particular, is unlikely to be as high as that of unregulated companies that are similar in size; hence, the application of a size-based premium to a utility is highly questionable. In fact, in direct contrast with Ms. Ahern's claims, a study by Annie Wong, reported in the *Journal of the Midwest Finance Association*, specifically found no justification for a size-based premium for utilities.[53]

Even for non-utilities, evidence of the existence of a size-based risk premium is not very strong. Ibbotson Associates data shows that out of a 1926-1999 study period, small stocks consistently out-performed large stocks only during the 1963-1983 period.[54] Fernholz found that a statistical property he termed the "crossover effect" was the primary cause of the difference between large and small company stock returns. The "crossover effect" measures the effect on rate of return of those stocks that switch from one size portfolio to another.[55] Fernholz states that as random price changes affect the size of stocks, some stocks cross over from one size portfolio to another. When a stock that starts in the large stock portfolio experiences a

[53] Wong, "Utility Stocks and the Size Effect: an Empirical Analysis," *Journal of the Midwest Finance Association*, 1993, pp. 95-101.

[54] Ibbotson Associates, *SBBI 2000 Yearbook*, pp. 38-39.

[55] Fernholz, "Crossovers, Dividends, and the Size Effect," *Financial Analysts Journal*, May/June1998, pp. 73-75.

936 random negative price change that moves it into the small stock portfolio, its
937 resulting negative return is assigned to, and therefore reduces, the return on
938 the large stock portfolio. Conversely, when that same stock experiences a
939 random positive price change that moves it back into the large stock
940 portfolio, its resulting positive return is assigned to, and therefore increases,
941 the return on the small stock portfolio.[56] The combination of portfolio
942 construction and random (i.e., non-systematic) price movements creates a
943 biased source of measurement error. Thus, the "small stock effect" may be
944 less a market return phenomenon than a modeling problem. That is, the
945 "small stock effect" may be nothing more than a statistical anomaly.

946 In another study of domestic stocks listed on the NYSE and AMEX, Jensen,
947 Johnson and Mercer, (hereinafter "Jensen") found that small stock premiums
948 appear to be related to monetary policy. Specifically, changes in monetary
949 policy play a prominent role in determining the magnitude of small stock
950 premiums. During expansive monetary periods, defined as months following
951 a reduction in the Federal Reserve discount rate, Jensen found that small
952 stock returns were significantly greater than large stock returns. Conversely,
953 during restrictive monetary periods, defined as months following an increase
954 in the discount rate, Jensen found that small stock returns were not
955 significantly greater than large stock returns.[57] Nevertheless, the applicability
956 of the Jensen results to small utility stocks is doubtful. First, since the Jensen
957 study was based on largely non-utility companies, its findings that small
958 stocks outperformed large stocks during "expansionary" monetary periods is

[56] Fernholz, "Crossovers, Dividends, and the Size Effect," *Financial Analysts Journal*, May/June1998, p. 73.

[57] Jensen, Johnson, and Mercer, "The Inconsistency of Small-Firm and Value Stock Premiums," *Journal of Portfolio Management*, p. 35.

not surprising. During monetary expansions, as the supply of loanable funds increases, investors are more likely to invest in speculative, small company stocks. However, during monetary contractions, as the supply of loanable funds decreases, investors are more likely to switch from speculative investments to safer ones – the well-known "flight to quality." It is counter-intuitive to claim that investors would consider the smaller firms in the regulated utility sector to be speculative investments; and Ms. Ahern has not supported that premise. Moreover, the Jensen study did not control its measurement of the small stock premium for risk as measured by beta or other means.[58] Therefore, the study does not support Ms. Ahern's size-based risk premium adjustment.

Even if a size-based risk premium exists for utilities, which it does not, Ms. Ahern's estimates of the size of the premium are questionable. First, Ms. Ahern's size-based risk premiums are based on historical returns whose shortcomings as proxies for expected returns were previously addressed.

Second, as noted previously, Ms. Ahern's historical size-based risk premium is based on the realized returns of the stocks listed on the New York Stock Exchange. That implies that small utility stocks are similar to small industrial stocks, a very questionable premise that Ms. Ahern did not verify. Ibbotson Associates issued a similar warning against applying its results outside stocks listed on the New York Stock Exchange.[59]

[58] Jensen, Johnson, and Mercer, "The Inconsistency of Small-Firm and Value Stock Premiums," *Journal of Portfolio Management*, pp. 30 and 34.
[59] Ibbotson Associates, *SBBI 2000 Yearbook*, p. 139.

Finally, Ms. Ahern's application of a size-based risk premium, on the basis of Ibbotson Associates' historical size-based risk premiums, is probably inconsistent with the manner in which Ibbotson Associates measured the historical size-based risk premiums. While Ms. Ahern adds a size-based premium to her CAPM-based risk premium analysis, which is based on adjusted Value Line betas, the studies I have reviewed on the effect of size on returns employ raw betas.[60] Since the Ibbotson Associates size-based risk premiums are a function of raw beta, Ms. Ahern should have used the same type of betas as Ibbotson Associates.

60. Q. Ms. Ahern applied her size-based risk premium to her final composite *estimate of CIWC's cost of equity.*[61] *Is that appropriate?*

A. No. By applying her size-based risk premium to her final composite estimate of CIWC's cost of equity, Ms. Ahern effectively applied it to her DCF results as well. However, additional risk premiums are never added to DCF-based cost of common equity estimates for market and financial risks since those risks are already reflected in the stock price parameter of DCF analysis. The alleged existence of a size-based risk premium stems from a belief that stock price movements are related to firm size. If the size-based risk premium exists, it would be reflected in the stock price parameter of DCF analysis. Therefore, no adjustment to the DCF analysis for the size effect would be necessary. Conversely, if the DCF-derived estimates of the cost of common equity did not reflect a risk premium associated with firm

[60] Wong, "Utility Stocks and the Size Effect: an Empirical Analysis," *Journal of the Midwest Finance Association*, 1993, p. 96; Ibbotson, Kaplan and Peterson, "Estimates of Small-Stock Betas Are Much Too Low," *Journal of Portfolio Management*, Summer 1997, p. 106.

[61] CIWC Exhibit 7, p. 6.

size, it could only be due to an absence of such a premium in stock prices. If stock prices did not reflect a size premium, then Ibbotson Associates and other researchers never would have detected a phenomenon in stock returns that resembles a size premium.

61. Q. If the alleged size-based risk premium is already reflected in stock prices, why might it be appropriate to add it to a CAPM-based analysis?

A. The alleged existence of a size-based risk premium stems from a supposed failure of the risk component of the CAPM, beta, to adequately explain the returns of smaller companies.[62] According to portfolio theory, unexpected variation in market returns (i.e., market risk) is the only source of risk that is priced. Therefore, beta reflects only that portion of stock return variation that can be attributed to variation in the returns of the market portfolio as a whole. The alleged existence of a size-based risk premium implies that small company stocks exhibit return variation that investors consider relevant in valuing common stocks but that market-wide common stock return variation cannot explain.

In summary, although the relationship between firm size and return has been studied from various angles, no theoretical or empirical support has been found for the notion that investors require higher rates of return from relatively small utility stocks than they do from relatively large utility stocks, contrary to the claims of Ms. Ahern. In fact, there is evidence specifically refuting such claims.

[62] Ibbotson Associates, *SBBI 2000 Yearbook*, p. 141.

62. Q. Does this conclude your direct testimony?

A. Yes, it does.

Consumers Illinois Water Company

Weighted Average Cost of Capital
Average for 2001 Test Year

Company Proposal

	Amount	Percent of Total Capital	Cost	Weighted Cost
Short-term Debt	$2,420,833	2.95%	7.24%	0.21%
Long-term Debt	37,471,705	45.62%	8.58%	3.91%
Preferred Stock	398,777	0.49%	5.52%	0.03%
Common Equity	41,854,118	50.95%	11.00%	5.60%
Total Capital	$82,145,433	100.00%		
Weighted Average Cost of Capital				**9.76%**

Staff Proposal

	Amount	Percent of Total Capital	Cost	Weighted Cost
Short-term Debt	$2,420,833	2.87%	7.57%	0.22%
Long-term Debt	$39,675,789	47.04%	8.48%	3.99%
Preferred Stock	$398,777	0.47%	5.52%	0.03%
Common Equity	$41,854,118	49.62%	9.9-10.4%	4.91-5.16%
Total Capital	$84,349,517	100.00%		
Weighted Average Cost of Capital				**9.14-9.39%**

Consumers Illinois Water Company

Embedded Cost of Long-term Debt

Average for 2001 Test Year

	Debt Issue Type, Coupon Rate (A)	Date Issued (B)	Maturity Date (C)	Original Principal Amount (D)	Face Amount Outstanding 12/31/2000 (E)	Face Amount Outstanding 12/31/2001 (F)	Avg. Future Test Year Face Amount Outstanding (G)	Unamortized Debt Discount or (Premium) (H)	Unamortized Debt Expense (I)	Carrying Value (J)	Coupon Interest Expense (K)	Amortization of Debt Discount or (Premium) (L)	Amortization of Debt Expense (M)	Annual Interest Expense (N)
1	First Mortgage Bonds													
2	10.400% Series M	12/06/1988	12/01/2018	$ 6,000,000	$ 6,000,000	$ 6,000,000	$ 6,000,000	$ 0	$ 104,490	$5,895,511	$ 624,000	$ 0	$ 5,999	$ 629,999
3	9.690% Series N	03/15/1991	03/01/2021	4,500,000	4,500,000	4,500,000	$ 4,500,000	0	$ 83,346	4,416,655	436,050	0	4,229	440,279
4	7.630% Series O	09/21/1995	09/01/2025	8,000,000	8,000,000	8,000,000	$ 8,000,000	0	$ 68,147	7,931,853	610,400	0	2,810	613,210
5	9.190% Series P	09/21/1995	07/15/2022	6,000,000	6,000,000	6,000,000	$ 6,000,000	0	$ 34,043	5,965,958	551,400	0	1,615	553,015
6	6.000% Series R	09/21/1995	09/01/2025	2,800,000	2,800,000	2,800,000	$ 2,800,000	0	$ 148,192	2,651,809	168,000	0	6,111	174,111
7	6.100% Series Q	09/21/1995	09/01/2025	10,000,000	10,000,000	10,000,000	$ 10,000,000	0	$ 529,060	9,470,941	610,000	0	21,817	631,817
8	5.850% PROPOSED NEW L-T Debt			4,500,000	4,500,000	4,500,000	$ 4,500,000	0	$ 362,128	4,137,872	263,250		12,416	275,666
9	Total First Mortgage Bonds			$ 41,800,000	$ 41,800,000	$ 41,800,000	$ 41,800,000	$ 0	$ 1,329,404	$ 40,470,596	$ 3,263,100	$ 0	$ 54,997	$ 3,318,097
10														
11	Other Long-Term Debt													
12	0.000% City of Danville	06/17/1975	none	$ 294,924	$ 70,659	$ 50,645	$ 60,652	$ 0	$ 0	$ 60,652	$ 0	$ 0	$ 0	$ 0
13				$ 294,924	$ 70,659	$ 50,645	$ 60,652	$ 0	$ 0	$ 60,652	$ 0	$ 0	$ 0	$ 0
14														
15	Net (Gain)/Loss on Reacquired Debt													
16	12.750% Series H	08/01/1983	08/01/1998	$ 1,500,000	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0
17	Series J	12/31/1984	12/31/1999	2,000,000	0	0	0	0	0	0	0	0	0	0
18	Series K & L	04/30/1987	06/01/2002	3,100,000	0	0	0	0	0	0	0	0	0	0
19	9.190% Series I	07/24/1992	07/15/2022	6,000,000	0	0	0	0	$ 108,782	(108,782)	0	0	5,180	5,180
20	7.500% Tax-Exempt	02/01/1990	02/01/2020	1,000,000	0	0	0	0	$ 746,678	(746,678)	0	0	39,991	39,991
21	Total Net (Gain)/Loss on Reacquired Debt			$ 13,600,000	$ 0	$ 0	$ 0	$ 0	$ 855,460	($855,460)	$ 0	$ 0	$ 45,171	$ 45,171
22	Total Long-Term Debt			$ 55,694,924	$ 41,870,659	$ 41,850,645	$ 41,860,652	$ 0	$ 2,184,863	$ 39,675,789	$ 3,263,100	$ 0	$ 100,168	$ 3,363,268
23	Embedded Cost of Long-Term Debt													8.48%

Consumers Illinois Water Company

Preferred Stock

Average 2001 Test Year

	Series (A)	Year of Issuance (B)	Dividend Rate (C)	Par Value of Issue (D)	Amount Outstanding (E)	Unamortized Prem./Disc. and Expense (F)	Net Proceeds (H)	Annual Dividends (I)	Amortization of Prem./Disc. and Expense (J)	Total Expense (K)	Embedded Cost of Preferred Stock (L)
1	5.5% Cumulative preferred	1967	5.50%	$ 400,000	$400,000	$ 1,223	$398,777	$22,000	$ -	$22,000	
2				$ 400,000	$400,000	$ 1,223	$398,777	$22,000	$ -	$22,000	5.52%

Notes: Column(I) = Column(D) - Column(F)
Column(H) = Column(F) X Column(C)
Column(K) = Column(I) + Column(J)
Column(L) = Column(K) / Column(H)

CONSUMERS ILLINOIS WATER COMPANY

Comparable Sample

Company	Factor 1	Factor 2	Factor 3	Factor 4	Cumulative Distance
Connecticut Water Service	-0.323	-0.097	1.153	1.516	0.930
Constellation Energy Corp.	0.361	0.681	-0.079	0.476	1.432
Hawaiian Electric	-1.773	0.241	-0.180	0.748	1.673
Idacorp, Inc.	-0.232	0.417	-0.504	0.718	1.173
Kansas City Power & Light	0.120	0.452	0.082	0.908	0.871
Northwest Natural Gas	0.028	-0.739	0.895	0.489	1.613
Pennichuck Corp.	-0.735	-1.338	0.529	1.167	1.666
Philadelphia Suburban	-0.544	-0.401	0.194	1.792	0.694
Potomac Electric Power	-0.812	0.715	0.228	0.767	1.024
Public Service Enterprises	-0.157	1.077	0.293	0.567	1.322
RGS Energy Group	0.599	0.538	-0.131	0.386	1.610
Comparable Sample Average	-0.315	0.140	0.225	0.867	

Water Sample

Company	Factor 1	Factor 2	Factor 3	Factor 4	Cumulative Distance
American States Water	0.050	-1.086	0.820	0.504	1.815
American Water Works	-1.284	-0.503	1.430	1.319	1.648
Artesian Resources	-0.708	-1.941	0.059	0.933	2.287
Connecticut Water Service	-0.323	-0.097	1.153	1.516	0.930
Middlesex Water	-0.907	-1.368	0.401	0.913	1.799
Pennichuck Corp.	-0.735	-1.338	0.529	1.167	1.666
Philadelphia Suburban	-0.544	-0.401	0.194	1.792	0.694
Water Sample Average	-0.636	-0.962	0.655	1.164	
Consumers Illinois Water Co.	-0.381	0.224	0.282	1.553	0.000

Source: Standard & Poor's *Utility Compustat*.

CONSUMERS ILLINOIS WATER COMPANY

Growth Rate Estimates and Ranges

Company	Zacks Earnings	IBES Earnings
American States Water	4.50%	4.50%
American Water Works	6.00	5.85
Artesian Resources	8.00	N/A
Connecticut Water Service	3.00	3.00
Constellation Energy Corp.	6.99	5.55
Hawaiian Electric	2.82	3.37
IdaCorp, Inc.	5.00	3.75
Kansas City Power & Light	3.70	3.80
Middlesex Water	3.00	3.00
Northwest Natural Gas	4.22	4.53
Pennichuck Corp.	3.00	3.00
Philadelphia Suburban	6.13	11.08
Potomac Electric Power	4.60	3.79
Public Service Enterprises	5.81	4.93
RGS Energy Group	2.50	2.50

Company	Low-End Earnings	High-End Earnings
American States Water	4.50%	4.50%
American Water Works	5.85	6.00
Artesian Resources	8.00	8.00
Connecticut Water Service	3.00	3.00
Constellation Energy Corp.	5.55	6.99
Hawaiian Electric	2.82	3.37
IdaCorp, Inc.	3.75	5.00
Kansas City Power & Light	3.70	3.80
Middlesex Water	3.00	3.00
Northwest Natural Gas	4.22	4.53
Pennichuck Corp.	3.00	3.00
Philadelphia Suburban	6.13	11.08
Potomac Electric Power	3.79	4.60
Public Service Enterprises	4.93	5.81
RGS Energy Group	2.50	2.50

Sources: *Zacks Investment Research*, August 9, 2000.
Institutional Brokers Estimate System, July 20, 2000.

CONSUMERS ILLINOIS WATER COMPANY

Quarterly Dividends and Stock Prices
as of August 9, 2000

Company	Current Dividend $D_{0,1}$	$D_{0,2}$	$D_{0,3}$	$D_{0,4}$	Next Dividend Payment Date	Stock Price
American States Water	$0.320	$0.320	$0.320	$0.320	09/01/2000	$27.0000
American Water Works	0.215	0.225	0.225	0.225	11/15/2000	25.0000
Artesian Resources	0.270	0.270	0.275	0.275	11/21/2000	23.2500
Connecticut Water Service	0.297	0.297	0.297	0.297	09/15/2000	32.0000
Constellation Energy Corp.	0.420	0.420	0.420	0.420	10/02/2000	36.6250
Hawaiian Electric	0.620	0.620	0.620	0.620	12/11/2000	31.9375
IdaCorp, Inc.	0.465	0.465	0.465	0.465	11/30/2000	37.6875
Kansas City Power & Light	0.415	0.415	0.415	0.415	09/20/2000	26.0625
Middlesex Water	0.295	0.305	0.305	0.305	09/01/2000	27.7500
Northwest Natural Gas	0.310	0.310	0.310	0.310	11/15/2000	23.5625
Pennichuck Corp.	0.240	0.240	0.240	0.240	11/15/2000	24.0000
Philadelphia Suburban	0.180	0.180	0.180	0.180	09/01/2000	22.8750
Potomac Electric Power	0.415	0.415	0.415	0.415	09/29/2000	25.9375
Public Service Enterprises	0.540	0.540	0.540	0.540	09/29/2000	35.8125
RGS Energy Group	0.450	0.450	0.450	0.450	10/25/2000	24.3750

Sources: *The Wall Street Journal*, August 10, 2000.
Standard & Poor's, *Utility Compustat*.
American Water Works Company, *Press Release*, http://biz.yahoo.com/bw/000706/nj_america.html.
Artesian Resources Corporation, *Press Release*, http://www.artesianwater.com/pr072600.htm.
Cleco Corporation, *Press Release*, http://biz.yahoo.com/prnews/000728/la_cleco_d.html.
Pennichuck Corporation, *Press Release*, http://biz.yahoo.com/bw/000609/nh_pennich.html.

CONSUMERS ILLINOIS WATER COMPANY

Expected Quarterly Dividends

Company	Low-End Estimates $D_{1,1}$	$D_{1,2}$	$D_{1,3}$	$D_{1,4}$
American States Water	$0.334	$0.334	$0.334	$0.334
American Water Works	0.225	0.238	0.238	0.238
Artesian Resources	0.275	0.275	0.297	0.297
Connecticut Water Service	0.306	0.306	0.306	0.306
Constellation Energy Corp.	0.443	0.443	0.443	0.443
Hawaiian Electric	0.637	0.637	0.637	0.637
IdaCorp, Inc.	0.482	0.482	0.482	0.482
Kansas City Power & Light	0.430	0.430	0.430	0.430
Middlesex Water	0.305	0.314	0.314	0.314
Northwest Natural Gas	0.323	0.323	0.323	0.323
Pennichuck Corp.	0.247	0.247	0.247	0.247
Philadelphia Suburban	0.191	0.191	0.191	0.191
Potomac Electric Power	0.431	0.431	0.431	0.431
Public Service Enterprises	0.567	0.567	0.567	0.567
RGS Energy Group	0.461	0.461	0.461	0.461

Company	High-End Estimates $D_{1,1}$	$D_{1,2}$	$D_{1,3}$	$D_{1,4}$
American States Water	$0.334	$0.334	$0.334	$0.334
American Water Works	0.225	0.239	0.239	0.239
Artesian Resources	0.275	0.275	0.297	0.297
Connecticut Water Service	0.306	0.306	0.306	0.306
Constellation Energy Corp.	0.449	0.449	0.449	0.449
Hawaiian Electric	0.641	0.641	0.641	0.641
IdaCorp, Inc.	0.488	0.488	0.488	0.488
Kansas City Power & Light	0.431	0.431	0.431	0.431
Middlesex Water	0.305	0.314	0.314	0.314
Northwest Natural Gas	0.324	0.324	0.324	0.324
Pennichuck Corp.	0.247	0.247	0.247	0.247
Philadelphia Suburban	0.200	0.200	0.200	0.200
Potomac Electric Power	0.434	0.434	0.434	0.434
Public Service Enterprises	0.571	0.571	0.571	0.571
RGS Energy Group	0.461	0.461	0.461	0.461

Sources: Staff Schedules 7.05 and 7.06.

CONSUMERS ILLINOIS WATER COMPANY

DCF Cost of Common Equity Estimates

Comparable Sample

Company	Low-End Estimate	High-End Estimate
Connecticut Water Service, Inc.	6.96%	6.96%
Constellation Energy Corp.	10.63	12.18
Hawaiian Electric Industries	11.05	11.66
IdaCorp, Inc.	9.01	10.35
Kansas City Power and Light	10.66	10.77
Northwest Natural Gas Co.	9.89	10.23
Pennichuck Corp.	7.22	7.22
Philadelphia Suburban Corp.	9.65	14.86
Potomac Electric Power	10.77	11.67
Public Service Enterprises	11.61	12.57
RGS Energy Group, Inc.	10.39	10.39
Average	9.80%	10.80%

Water Utility Sample

Company	Low-End Estimate	High-End Estimate
American States Water	9.72%	9.72%
American Water Works	9.74	9.89
Artesian Resources	13.13	13.13
Connecticut Water Service	6.96	6.96
Middlesex Water	7.69	7.69
Pennichuck Corp.	7.22	7.22
Philadelphia Suburban	9.65	14.86
Average	9.16%	9.93%

CONSUMERS ILLINOIS WATER COMPANY

Risk Premium Analysis

Interest Rates as of August 9, 2000

U.S. Treasury Bills[1]		U.S. Treasury Bonds[2]	
Discount Rate	Effective Yield	Bond Equivalent Yield	Effective Yield
6.07%	6.40%	5.73%	5.81%

Risk Premium Cost of Equity Estimates

Proxy Group	Risk-Free Rate		Beta		Risk Premium		Cost of Common Equity
Water Sample	5.81%	+	0.45	×	(16.24% – 5.81%)	=	10.50%
Comparable Sample	5.81%	+	0.42	×	(16.24% – 5.81%)	=	10.19%

[1] U.S. Treasury bill yields are quoted on a 360-day discount basis. The effective yield is determined as follows:

$$Effective\ yield = \left(1 + \frac{discount\ rate \times \left(\frac{days\ to\ maturity}{360} \right)}{1 - discount\ rate \times \left(\frac{days\ to\ maturity}{360} \right)} \right)^{\left(\frac{365}{days\ to\ maturity} \right)} - 1$$

where *days to maturity* equals ninety-one days.

[2] The bond equivalent yield on U.S. Treasury bonds represents a nominal rather than an effective yield. The effective yield is calculated as follows:

$$Effective\ yield = [1 + (bond\ equivalent\ yield \div 2)]^2 - 1.$$

Ahern Risk Premium Model

Ms. Ahern's risk premium model (for the proxy group of seven water companies) can be depicted mathematically as follows:[1]

$$R_j = R_{A2} + \{[b_j \times (R_{m1} - R_{Aa/Aaa}) + (R_{m2} - R_{A\text{-}bond})] / 2\}$$

where R_j ≡ the required rate of return for security j;

R_{A2} ≡ a derived estimate of the yield on a long-term bond rated A2 by Moody's;

R_{m1} ≡ average of historical and projected estimates of the overall market return;

R_{m2} ≡ S&P's public utility index return (1928-1999);

$R_{Aa/Aaa}$ ≡ average of historical return on long-term high-grade corporate bonds and a prospective yield on Aaa rated corporate bonds;

$R_{A\text{-}bond}$ ≡ derived historical estimate yield on an A rated bond; and

b_j ≡ the measure of risk for security j.

That formula can be restated as follows:

$$2R_j = 2R_{A2} + [b_j \times (R_{m1} - R_{Aa/Aaa})] + [(R_{m2} - R_{A\text{-}bond})]$$

$$2R_j = [R_{A2} + b_j \times (R_{m1} - R_{Aa/Aaa})] + [R_{A2} + (R_{m2} - R_{A\text{-}bond})]$$

$$R_j = \{[R_{A2} + b_j \times (R_{m1} - R_{Aa/Aaa})] + [R_{A2} + (R_{m2} - R_{A\text{-}bond})]\} / 2$$

$$R_j = [(R_{A2} + b_j \times RP_1) + (R_{A2} + RP_2)] / 2$$

where $RP_1 = R_{m1} - R_{Aa/Aaa}$; and

$RP_2 = R_{m2} - R_{A\text{-}bond}$

[1] See Company Exhibit 7, Schedule 15, pp. 1, 5, 6, and 8.

REBUTTAL TESTIMONY

OF

MICHAEL MCNALLY

FINANCE DEPARTMENT

FINANCIAL ANALYSIS DIVISION

ILLINOIS COMMERCE COMMISSION

CONSUMERS ILLINOIS WATER COMPANY
PROPOSED GENERAL INCREASE IN WATER RATES

DOCKET NO. 00-0337, -0338, -0339 CONSOLIDATED

OCTOBER 26, 2000

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Witness Identification

Q. Please state your name and business address.

A. My name is Michael McNally. My business address is 527 East Capitol Avenue, Springfield, IL 62701.

Q. Are you the same Michael McNally who previously testified in this proceeding?

A. Yes, I am.

Q. Please state the purpose of your rebuttal testimony in this proceeding.

A. The purpose of my rebuttal testimony is to respond to the rebuttal testimony of Consumers Illinois Water Company ("CIWC" or "Company") witnesses Frank X. Simpson (Company Exhibit 6.0R) and Pauline M. Ahern (Company Exhibit 7.0R).

Response to Mr. Simpson

Q. Please comment on Mr. Simpson's assertions that CIWC's capital structure should be adjusted to reflect "the $3,000,000 equity infusion listed in the Company's response to Data Request MGM 3.07."[1]

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[1] Company Exhibit 6.0R, page 3.

A. As stated in my response to Company data request 9, the balance of common equity in my direct testimony (ICC Staff Exhibit 7.00, Schedule 7.01) was taken directly from CIWC Schedule D-1, from the Company's initial filing. The balance of common equity shown on the Company's Amended Exhibit 1.5 (as provided in response to MGM 3.07) differs, with no explanation, from the balance provided in the Company's initial filing. Furthermore, Staff is unaware of any prior authorization for CIWC to issue $3,000,000 in common equity or any petition before the Commission seeking such authorization. Nevertheless, I have adjusted my proposed capital structure and overall cost of capital recommendation to reflect the effects of the proposed $3,000,000 equity issuance, as shown on ICC Staff Exhibit 14.00, Schedule 14.01. I recommend, however, that if the proposed $3,000,000 equity issuance has not received authorization by the briefing stage of this proceeding, the proposed $3,000,000 equity issuance should be eliminated from the capital structure in the final Order.

Response to Ms. Ahern

Q. Please evaluate Ms. Ahern's rebuttal testimony.

A. Ms. Ahern's rebuttal contained nothing to change my opinion of CIWC's cost of common equity. In my judgment, the investor required rate of return on common equity for CIWC ranges from 9.9% to 10.4% with a midpoint of 10.15%.

General Misconceptions

Q. Ms. Ahern claims several times that you acknowledged that companies with A-rated bonds are less risky than CIWC.[2] Does she correctly present your position?

A. No. The statement to which Ms. Ahern refers was taken from a paragraph regarding the cost of common equity of CIWC. That statement reads, "Along with DCF and risk premium analyses, I have considered the observable 8.13% rate of return the market currently requires on less risky A-rated utility long-term debt."[3] The statement clearly compares the risk of CIWC's equity with the risk of A-rated debt. Of course, investing in the equity of CIWC is riskier than investing in the debt of an A-rated company. My analysis does not indicate that the equity of CIWC is riskier than the equity of companies with A-rated debt.

Q. In response to the statement at page 10, lines 195-198 of your direct testimony, Ms. Ahern claims that "a comprehensive analysis of CIWC's risks vis-a-vis the companies upon whose market data both I and Mr. McNally rely is mandatory..."[4] Please comment.

A. I agree with Ms. Ahern that it is appropriate to analyze the risk of CIWC and the companies in my proxy groups in order to assess their comparability. That is why I used a principal components risk analysis.[5] However, the sentence from my direct

[2] Company Exhibit 7.0R, pages 9, 10, and 28.
[3] ICC Staff Exhibit 7.00, page 23.
[4] Company Exhibit 7.0R, page 4.
[5] ICC Staff Exhibit 7.00, pages 9-10 and 25.