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June 23, 2003

VIA HAND DELIVERY

Ms. Sara Kyle, Chairman
Tennessee Regulatory Authority
460 James Robertson Parkway
Nashville, TN 37243

Re: Petition of Tennessee American Water Company to Change and Increase Certain Rates and Charges So As to Permit It to Earn a Fair and Adequate Rate of Return on Its Property Used and Useful In Furnishing Water Service to Its Customers, Docket No. 03-00118.

Dear Chairman Kyle:

Pursuant to the hearing officer's Order of June 12, 2003, enclosed please find original and thirteen (13) copies of the rebuttal testimony of the following four witnesses in behalf of the Tennessee-American Water Company:

1. Mr. Michael A. Miller;
2. Mr. Paul R. Moul;
3. Mr. Paul R. Herbert; and
4. Dr. Christopher C. Klein.

Should you have any questions concerning this filing, please do not hesitate to call me. With kindest personal regards, I remain

Very truly yours,

T.G. Pappas

TGP/sdt
Enclosure
cc: Certificate of Service List
Mr. William F. L'Ecuyer (via facsimile)
Mr. Michael Miller (via facsimile)
Mr. Roy Ferrell (via facsimile)

R. Dale Grimes, Esq.
George Masterson, Esq.

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the rebuttal testimony of Mr. Michael A. Miller, Mr. Paul R. Moul, Mr. Paul R. Herbert, and Dr. Christopher C. Klein has been served, via the method(s) indicated, on this the 23rd day of June, 2003:

[ ] Hand [ ] Mail [ ] Facsimile [x] Overnight, UPS	Michael A. McMahan, Esq. Phillip A. Noblett, Esq. Lawrence W. Kelly, Esq. Nelson, McMahan & Noblett 801 Broad Street, Suite 400 Chattanooga, TN 37402
[x] Hand [ ] Mail [ ] Facsimile [ ] Overnight, UPS	Vance L. Broemel, Esq. Shilina B. Chatterjee, Esq. Assistant Attorney General Office of the Attorney General Consumer Advocate and Protection Division 425 5th Avenue North, 2nd Floor Nashville, TN 37243-0491
[x] Hand [ ] Mail [ ] Facsimile [ ] Overnight, UPS	Henry M. Walker, Esq. Boult, Cummings, Conners & Berry, PLC 414 Union Street, Suite 1600 Nashville, TN 37219
[ ] Hand [ ] Mail [ ] Facsimile [x] Overnight, UPS	David C. Higney, Esq. Grant, Konvalinka & Harrison, P.C. 633 Chestnut Street, 9th Floor Chattanooga, TN 37450

T.G. Pappas

COMMONWEALTH OF PENNSYLVANIA
COUNTY OF CUMBERLAND, TO-WIT:

AFFIDAVIT

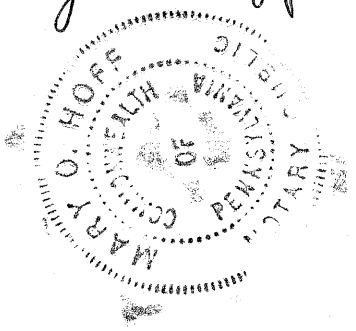
BEFORE ME, the undersigned authority, duly commissioned and qualified in and for the Commonwealth and County aforesaid, personally came and appeared Paul R. Herbert, who, being by me first duly shown deposed and said that;

He is appearing as a witness on behalf of Tennessee-American Water Company before the Tennessee Regulatory Authority, and if present before the Authority and duly sworn, his rebuttal testimony would set forth in the annexed transcript.

Paul R. Herbert

Taken, subscribed and sworn to before me this 20th day of June, 2003.

Mary O. Hoff



COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Mary O. Hoff, Notary Public
East Pennsboro Twp., Cumberland County
My Commission Expires June 2, 2007
Member, Pennsylvania Association Of Notaries

BEFORE THE
TENNESSEE REGULATORY AUTHORITY

REBUTTAL TESTIMONY OF PAUL R. HERBERT

ON BEHALF OF TENNESSEE-AMERICAN WATER COMPANY

CASE NO. 03-00118

CONCERNING

COST OF SERVICE ALLOCATION

AND

CUSTOMER RATE DESIGN

JUNE 2003

BEFORE THE TENNESSEE REGULATORY AUTHORITY

RE: TENNESSEE-AMERICAN WATER COMPANY

CASE NO. 03-00118

REBUTTAL TESTIMONY OF PAUL R. HERBERT

1. Q. Please state your name and address.

A. My name is Paul R. Herbert. My business address is 207 Senate Avenue, Camp Hill, Pennsylvania.

2. Q. By whom are you employed?

A. I am employed by Gannett Fleming, Inc.

3. Q. Are you the same Paul R. Herbert that submitted direct testimony in this case?

A. Yes, I am.

4. Q. What is the subject of your rebuttal testimony?

A. My rebuttal testimony will address the testimony of City of Chattanooga's witness Mr. Jim Mac Coppinger, concerning public fire hydrant cost of service and the Consumer Advocate and Protection Division's witness Dr. Steve N. Brown, concerning the proposed revenue distribution.

5. Q. Please address the testimony of Mr. Coppinger.

A. Mr. Coppinger, Fire Chief for the City of Chattanooga, calculates the cost of the estimated water used for fire purposes in the City. His calculation is based on an estimated annual fire usage of 630,000

gallons or 84,000 cubic feet and the tail-block rate of $0.555 per hundred cubic feet. However he erred when he applied the rate to 84,000 cubic feet rather than 840 hundred cubic feet. His estimated cost should be $466.20, not $44,620.

6. Q. Is this relevant?

A. No. The cost of service associated with providing public fire service has little to do with the actual amount of water used for fire purposes. The cost of public fire service is based on the direct costs associated with public fire hydrants, such as operation and maintenance expenses, depreciation and return on investment. It also includes an allocable portion of the distribution system such as mains, pumping and storage facilities. These facilities are designed and sized in order to provide the instantaneous demand required when a fire emergency occurs.

7. Q. What method did you use to determine the cost of service related to public fire service?

A. I used the widely recognized base-extra capacity method of cost allocation, described in the water rates manual M1, published by the American Water Works Association. The manual describes the appropriate factors to consider when allocating costs to customer classifications including public fire service.

8. Q. What is the result of your study?

A. The cost of service study shows that the cost of service allocated to public fire service is $1,473,347 annually. The Company is proposing

to recover 25% of this cost or $368,337 through public fire hydrant rates. The proposed public fire hydrant rate is $73.53 annually per hydrant.

9. Q. Please address Dr. Brown's revenue distribution proposal.

A. Dr. Brown concludes that since the Company does not have actual demand data by customer classification, the proposed revenue increase should be across-the-board rather than the revenue allocation proposed by the Company.

10. Q. Do you agree with his conclusion?

A. No, not at all. It is not imperative to have actual demand data in order to estimate non-coincident peak factors for each customer classification. Water cost of service studies are conducted without such data in numerous cases in many jurisdictions. Dr. Brown is more familiar with the power industry where load studies are conducted on an ongoing basis. This is not the norm for the water industry.

The AWWA M1 manual states that one can reasonably estimate class factors by investigating the system peak day and hour data, observing monthly consumption patterns of certain classes, and using results of demand studies of other water utilities exhibiting like characteristics. The manual also provides tests for the reasonableness of estimated class factors. My estimates for TAWC fall within the reasonable limits.

11. Q. What would be the effect of Dr. Brown's recommendation for an across-the-board increase?

A. It would continue the disparity under the existing rate structure which shows that revenues need to be more aligned with costs.

12. Q. What is your recommendation should the TRA grant an increase less than the Company's request?

A. I recommend that the proposed service charges and public fire hydrant rates should remain as-filed, and that the volumetric rates should be scaled back so that the revenue increase by classification is in proportion to the proposed revenue increase by classification, excluding public fire protection.

13. Q. Does this conclude your rebuttal testimony?

A. Yes, it does.

TENNESSEE REGULATORY AUTHORITY

STATE OF TENNESSEE

COUNTY OF DAVIDSON

BEFORE ME, the undersigned authority, duly commissioned and qualified in and for the State and County aforesaid, came and appeared Christopher C. Klein, who swears and deposes that:

He is appearing as a witness on behalf of Tennessee-American Water Company before the Tennessee Regulatory Authority, and if present before the Authority and duly sworn, his testimony is as set forth in the annexed transcript consisting of seven pages.

Sworn and subscribed
this 23rd day of June 2003.

Tillie Smith
Notary Public

My commission expires 5/28/06

TILLIE SMITH
NOTARY PUBLIC AT LARGE
DAVIDSON COUNTY, TENN.
My Commission Expires MAY 28, 2006

TENNESSEE-AMERICAN WATER COMPANY
DOCKET NO. 03-00118
REBUTTAL TESTIMONY OF
DR. CHRISTOPHER C. KLEIN

Q. **Please state your name and your current position.**

A. My name is Christopher C. Klein and I am an Associate Professor in the Economics and Finance Department at Middle Tennessee State University (MTSU) in Murfreesboro, Tennessee.

Q. **What is your educational background?**

A. I received a B. A. in Economics from the University of Alabama in 1976 and I received a Ph. D. in Economics from the University of North Carolina at Chapel Hill in 1980.

Q. **What is your professional experience involving regulated industries?**

A. I was employed as an Economist in the Antitrust Division of the Bureau of Economics at the Federal Trade Commission (FTC) in Washington, D.C., for six years starting in 1980. In 1986, I was hired as the first Economist for the Tennessee Public Service Commission (TPSC). Although my title changed over the years, I functioned as the Chief Economist for the TPSC and, after 1996, the Tennessee Regulatory Authority (TRA), until August of 2002, when I assumed my current position with MTSU.

Q. **What were your duties at the FTC?**

A. I performed the economic analysis in antitrust investigations involving more than 20 industries and contributed to staff reports on mergers in the petroleum industry, competition in grocery retailing, and the economics of predatory or sham litigation.

Q. **What was your primary responsibility at the TPSC?**

A. I was an expert witness for the staff of the TPSC in rate cases and other similar proceedings involving telecommunications, natural gas, electric and water utilities and motor carriers. I testified in 36 dockets before the TPSC on the issues of cost of capital, rate design, and competitive effects. I also filed testimony before the Federal Communications Commission (FCC).

Q. **How did your responsibilities change when the TRA supplanted the TPSC?**

A. I oversaw the Utility Rate Division and then the Economic Analysis Division. The TRA staff no longer testified in proceedings before the agency, but provided analysis and advice to the TRA Directors. I was responsible for all such advice and analysis provided to the Directors by these Divisions, either individually or in concert with other TRA staff, in all proceedings that came before the agency for resolution. These proceedings included rate cases and tariff filings by public utilities, as well as those associated with the implementation of the federal Telecommunications Act of 1996.

Q. **Were you a member of any regulatory committees or boards while you worked for the TPSC and the TRA?**

A. Yes. I was a member of the National Association of Regulatory Commissioners (NARUC) Staff Subcommittee on Gas. I was a member of, and Chaired, the Research Advisory Committee to the Board of Directors of the National Regulatory Research Institute (NRRI). I also served on the State Staff of the FCC's Federal-State Joint Board in CC Docket No.80-286 (the "Separations" Joint Board) and as a Group Leader on the NARUC Staff Subcommittee on Accounts Multi-state Audit Team that produced the 1988 Report on Bell Communications Research.

Q. **What is your primary responsibility at MTSU?**

A. I teach classes in the general area of applied microeconomics, including Managerial Economics and Principles of Microeconomics, as well as undertaking scholarly research and participating in various university committees.

Q. **Have you taught at any other universities?**

A. I taught classes in the Economics of Regulation and Antitrust Economics in the Economics Department at Vanderbilt University on an adjunct basis for several years.

Q. **Are you a member of any professional organizations?**

A. I am a member of the American Economic Association and its Transportation and Public Utilities Group, the Southern Economic Association, the Industrial Organization Society, and Alpha Pi Mu, the National Industrial Engineering Honor Society.

Q. **Have you published articles in professional or academic journals and presented papers at professional meetings?**

A. More than 30 of my articles have appeared in in professional or academic journals and I have made more than 50 presentations at professional meetings.

PURPOSE OF TESTIMONY

Q. **What is the purpose of your testimony?**

A. I will respond to the direct testimony of various witnesses concerning the rates to be charged to the City of Chattanooga for fire hydrants and public fire protection service.

CHARACTERISTICS OF EFFICIENT RATES

Q. **What is the most economically efficient and appropriate method for collecting revenue to cover the cost of fire protection service?**

A. In Economics, efficiency in the use of resources occurs when the net benefits of an activity to society are maximized. This generally requires that the benefits from the last unit of a good or service consumed equal the costs incurred in producing that unit. In this context, the best method of pricing a good or service allows consumers to compare the costs incurred in producing the last unit of a good to the benefits they receive from it. Consumers then maximize their own net benefits from purchasing the good or service by buying that quantity that equalizes the costs and benefits associated with the last unit consumed. Consumers' individual decisions lead society to the most efficient use of

resources when these cost-benefit comparisons guide their decisions. The same principles apply to pricing fire protection services.

Q. **How are these principles used to derive prices or rates?**

A. Ideally, prices or rates for a good or service should reflect the marginal cost of providing it. Marginal cost is the cost associated with producing the last unit of the good consumed. When prices are set equal to marginal cost, then consumers will purchase that quantity at which the price is just equal to the additional, or marginal, benefits they receive from the last unit purchased. Consequently, consumers' decisions lead society to produce the efficient amount of the good or service.

Q. **Can this ideal be met in pricing the services of a public utility?**

A. Unfortunately, the ideal pricing method cannot be applied to public utility rates in general.

Q. **Why not?**

A. Public utilities, including water utilities, often have the characteristics of natural monopoly. Natural monopolies are called "natural" because the average cost of providing the service declines with the quantity of the service provided. In this case, one producer can provide the service at the lowest possible total cost. When average cost is declining in this way, marginal cost is less than average cost. That means that setting utility service prices equal to marginal cost does not collect enough revenue to cover all the costs incurred in providing a service.

Q. **Why is this a problem?**

A. If the prices or rates set for an investor-owned public utility do not collect enough revenue to cover all the costs, then the utility will not earn an adequate return on its investment. If this situation persists, the utility will eventually go out of business to the detriment of its investors as well as its customers.

Q. **Is this the reason that the courts have found that investor-owned public utility rates must be set so as to allow the utility to earn a just and reasonable, or fair rate of return on its investment?**

A. Yes. This is not only a legal requirement, but an economic necessity if the utility is to remain in business over the long term. Consequently the cost of capital witnesses in this case (Mr. Moul, Mr. Mosby, and Dr. Brown) go on at length in an effort to determine the just and reasonable rate of return that the TRA should allow.

Q. **If the cost characteristics of water utilities and the fair rate of return requirement for investor-owned utilities prevent regulators from setting service prices or rates in the ideal economic manner, how should these rates be determined?**

A. Economic analysis suggests that the efficiency lost from not setting prices equal to marginal cost can be minimized by setting service prices above marginal cost in proportion to the relative elasticities of demand of the utility's customers. If demand elasticities – that is the sensitivity of customers' consumption of a service to changes in

its price – are unknown, then prices should be set above marginal cost in accord with practical and policy considerations.

Q. **What are the resulting minimum conditions for utility service rates or prices in this context?**

A. At a minimum, the rates set by a regulatory body for an investor-owned public utility should 1) equal or exceed marginal cost; 2) collect enough revenue to give the utility's investors a fair, just and reasonable return on their investment; and 3) satisfy any practical or policy concerns that serve the public interest as determined by the regulators.

LOCAL GOVERNMENTS AS RATEPAYERS

Q. **Do these conditions apply to fire protection service when the "customer" is a city or other government body?**

A. Yes, but a city or other government entity must pass through the cost of fire protection to the populace, who are the final consumers of the service, in the form of taxes.

Q. **Can the taxpayers make choices based on a comparison of the additional benefits to the additional costs of fire protection in this context?**

A. The process is more convoluted than if end-users paid for fire protection service directly, but a comparison can still be made. For example, voters may have the opportunity to choose higher taxes for better fire protection or lower taxes for less fire protection through the political process. Voters could then compare their share of the taxes to their share of the benefits and vote accordingly.

Q. **How do citizens realize the benefits of fire protection services?**

A. Beyond the obvious – a lower probability that their houses burn down – the benefits of fire protection are capitalized into property values. Better fire protection may also translate into lower insurance prices. These effects make common sense and are supported by economic research. Studies have found that higher expenditures on fire protection are associated with higher property values and that fire protection and insurance are substitutes – that is, people facing high property insurance prices, other things equal, are willing to spend more on fire protection to reduce their insurance costs.

Q. **What happens if local government services, such as fire protection, are supported by property taxes?**

A. Supporting local government services with property taxes can simplify citizens' cost-benefit comparisons. The value of services such as police and fire protection are reflected in property values, which are then taxed to support those services. Citizen/voters can then choose to live where the tax-benefit relationship best suits them, or they can work to change that relationship through the political process.

COLLECTING REVENUE TO COVER FIRE PROTECTION SERVICES

Q. **Are you aware of the different methods that water utilities may use to collect revenues to cover the cost of providing fire protection service?**

A. In the case of investor-owned utilities, the options are limited to either charging local governments directly, or collecting the necessary revenues from the customer base at large. Municipal utilities may have the appearance of an additional option in the form of indirect tax subsidies. The utility could set its rates such that the revenues it collects from its customers is less than its costs. The resulting deficit must be made up from local tax revenues. This can be interpreted, however, as just another method of charging local governments, and ultimately taxpayers, for these services.

Q. **Which methods do actual utilities use to recover the cost of fire protection service?**

A. Mr. Miller has testified to the practices used in various other states. Essentially, investor-owned utilities in California, Missouri, Illinois and Virginia do not charge municipalities for fire protection. Wisconsin and Iowa appear to have mixed systems that may allow both direct charges to municipalities and recovery of fire protection costs from the general customer base. West Virginia and Pennsylvania have capped the charges to local governments, with the remaining costs recovered from the general customer base.

Q. **What methods are used in Tennessee?**

A. The approaches are mixed. Tennessee-American charges municipalities for fire protection services. Ms. Madison and Chief Coppinger have testified for the City of Chattanooga that Eastside Utility District does not charge the city for fire hydrants, while Hixson Utility District charges the city the same amount as TAWC for fire hydrants. The major municipal water utilities in Tennessee were surveyed at my request. Memphis Light, Gas and Water and the Knoxville Utilities Board charge for fire protection services, while Nashville's Metro Water Services recovers these costs from the general customer base.

Q. **A number of states and utilities do not charge local governments in this way. Are there no advantages to recovering fire protection costs from the general customer base of the water utility?**

A. The people who benefit from fire protection service are largely the same people, or entities in the case of businesses and governments, that purchase water from the utility. On equity grounds, then, there is a positive aspect to this approach as the revenues to cover fire protection costs are recovered from the same groups that benefit from fire protection in general. Not many, if any, water customers are forced to contribute to fire protection services from which they do not benefit, for example. On the other hand, there is no reason to expect that the benefits from fire protection are distributed across the population in the same way as is the consumption of water. Thus, the costs of fire protection service are not collected from individuals in proportion to the benefits each receives from that service when these costs are simply blended into the rates charged to the general customer base of the utility.

Q. **Is TAWC's proposal to recover 25% of the calculated "cost of service" for public fire protection in public fire protection rates consistent with your analysis?**

A. Yes. Cost of service studies can be a useful guide to ratemaking, in that rates set to recover the costs attributed to all of a utility's services in these studies are practically guaranteed to recover sufficient revenue to satisfy the utility's fair rate of return revenue

requirement. These studies, however, calculate what economists would call estimates based on average costs and do not reflect the marginal costs which are preferred for ideal ratemaking. Moreover, different experts may disagree on the calculation of these costs. In this context, regulators and others may apply their judgment as to how much of the calculated cost of a service is actually appropriate to recover from users of that service. If one determines, as TAWC has, that 25% of the calculated cost of fire protection service is the appropriate amount of cost to actually recover in public fire protection rates, then that is consistent with my analysis. The appropriate costs of a service, however determined, are best recovered from the users of that service.

Q. **Is the proposal made by Dr. Brown and Mr. Gorman to remove from the company's revenue requirement the approximately $1.1 million of the calculated cost of fire protection service that is not recovered in public fire protection rates consistent with your analysis?**

A. No. TAWC will not be allowed a reasonable opportunity to earn a fair rate of return if this is done.

Q. **Why not?**

A. Suppose the TRA goes all the way through this rate case and makes all the decisions on costs, revenues, rate base and rate of return that are necessary to determine the revenue TAWC requires in order to earn a fair rate of return on the value of its investment. This is what I call the fair rate of return revenue requirement. If one merely subtracts the $1.1 million from this revenue requirement before actually setting rates, the resulting revenues from rates will be $1.1 million less than the fair rate of return revenue requirement. Consequently, TAWC cannot expect to realize a fair rate of return as a result of the rates set under this proposal.

Q. **Isn't this what the TRA's Order in Docket No. 99-00891 did in approving the $1.1 million reduction in the public fire protection rates that TAWC charged the City of Chattanooga?**

A. No. In that case, TAWC alleged that cost savings and other sources of revenue growth would offset the loss in revenues from that rate reduction. There was no reason to believe that TAWC could not realize a fair rate of return as an immediate result of that action.

Q. **Is the subtraction of the $1.1 million in calculated fire protection costs from TAWC's revenue requirement, as opposed to adding this amount to the revenues to be collected from TAWC's general customer base, consistent with the way that rates are set by municipal utilities in Tennessee?**

A. No. Any costs that such utilities incur in providing services are generally recovered from revenues collected under rates charged for those various services. If any costs are not recovered from one group of customers, as might occur if those customers' rates were reduced, those costs must be recovered from the rates charged for services provided to other customers. TAWC's rates are subject to the same constraints.

Q. **Does this conclude your testimony at this time?**

A. Yes.

STATE OF WEST VIRGINIA

COUNTY OF KANAWHA, TO-WIT:

AFFIDAVIT

BEFORE ME, the undersigned authority, duly commissioned and qualified in and for the State and County aforesaid, personally came and appeared Michael A. Miller, who, being by me first duly sworn deposed and said that;

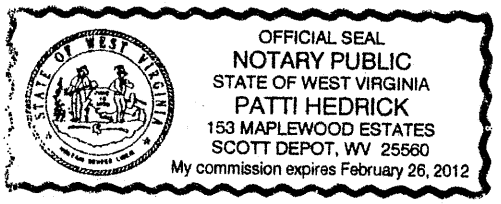
He is appearing as a witness on behalf of Tennessee American Water Company before the Tennessee Regulatory Authority, and if present before the Authority and duly sworn, his rebuttal testimony would set forth in the annexed transcript.

Michael A. Miller

Taken, subscribed and sworn to before me this 20th day of June, 2003.

My commission expires February 26, 2012.

Patti Hedrick
Notary Public



TENNESSEE-AMERICAN WATER COMPANY
CASE NO. 03-00118
REBUTTAL TESTIMONY
MICHAEL A. MILLER

1. Q. DID YOU PROVIDE DIRECT TESTIMONY IN THIS CASE?

A. Yes.

2. Q. WHAT AREAS WILL YOU BE ADDRESSING IN YOUR REBUTTAL TESTIMONY?

A. I will primarily address testimony about the public fire service issue of several witnesses for the AG, the City and CMA. I will also address the testimony of the intervenors regarding capital structure, cost of debt and cost of equity.

3. Q. MR. MILLER, WOULD YOU AGREE THAT THERE MIGHT BE SOME UNCERTAINTY AND CONFUSION CREATED BY THE TRA'S ORDER OF SEPTEMBER 26, 2000, APPROVING THE PUBLIC FIRE SERVICE REDUCTION?

A. Yes, I agree that there is language in the Order which might cause confusion, but I believe that the position that we have taken in this case is consistent with the logical interpretation of the Order.

4. Q. WHAT MADE THE COMPANY BELIEVE THAT THE ORDER WAS CONSISTENT WITH THE INTENTIONS OF THE CITY AND THE COMPANY?

A. I believe my testimony will clarify the Company's position regarding the correct interpretation of the Order. Basically, the

Company understood that it would have to generate revenue growth and expense savings ('Growth/Savings") to offset the reduced fire protection revenue, but because the rate reduction was phased over two years, the Company felt confident it could do that. The Company also understood that if it did not generate those Growth/Savings it would absorb the earnings impact of that reduction. Based on its financial projections at that time, the Company believed it would be three or four years before it would be required to seek rate relief. Unfortunately, several recent developments such as the bankruptcy of North American Royalties, increased property tax assessments, and the need for earlier pension contributions have accelerated that need for rate relief. While the Company felt the language of the Order was troublesome, it believed based on both parties' representations and the language of the Order that this issue would be correctly interpreted in a rate case three or four years in the future.

5. Q. IS THE COMPANY'S POSITION ON PUBLIC FIRE SERVICE IN THIS CASE CONSISTENT WITH THE ORDER?

A. Yes. We do not believe that the TRA meant that the Company and its stockholders would be required to bear the cost of providing fire protection through both Growth/Savings permanently flowed to the rate payers in this case and as an additional reduction from the Company's established revenue

requirement.

6. Q. THE AG AND OTHER INTERVENORS INSIST THAT THE ORDER CANNOT BE SATISFIED IN ANY WAY OTHER THAN BY A PERMANENT REDUCTION OF THE COMPANY'S APPROVED COST OF SERVICE. WHY DO YOU THINK THEY ARE WRONG?

A. I believe the last sentence before the ordering paragraph is critical to arriving at a correct interpretation of that Order. That sentence says, "Therefore given the facts in this instance, as discussed above, the Authority, consistent with the Company's representations, does not deem it appropriate that this voluntary contribution loss be recoverable from the ratepayers." It is critical to review and understand what the Company represented to the TRA in its filing, discovery, and comments at the hearing on January 11, 2000. I do not believe that a logical interpretation of the Order can be made without considering what the Company represented to the TRA, particularly the comments at the hearing.

7. Q. DOES THE TESTIMONY OF DR. BROWN OR THE OTHER INTERVENORS MENTION THIS SENTENCE OF THE ORDER?

A. No. I see no mention of that language in other testimony.

8. Q. ARE THERE OTHER PARTS OF THE ORDER THAT

SUPPORT THE COMPANY'S POSITION?

A. Yes. On pages 2-3 of the Order the TRA held, "It is clear that in order to afford the Company any opportunity to achieve its presently authorized return that either revenue streams from other sources must be increased or the company and its stockholders must agree to absorb the shortfall."

9. Q. WHAT IS THE SIGNIFICANCE OF THAT STATEMENT?

A. It demonstrates that the TRA recognized that Growth/Savings presented the Company's only offset to the reduced fire service revenue. More importantly it is written in the alternative and says, "or the Company and its stockholders must agree to absorb the shortfall." This indicates to us that the Company had to do one or the other, but not both. It certainly does not indicate a permanent annual reduction in the Company's revenue requirement as established in this or future rate cases. We believed then and believe now that if the Company did not generate Growth/Savings at or above the amount of reduced fire protection revenue, the stockholders would absorb that shortfall (the difference). The Company believed this applied to the period between the dates of the Order and until other factors drove the need to increase rates ("stub period"). The Company understood that if it could not demonstrate that Growth/Savings exceeded the reduced fire protection revenue it was at risk for rate recovery of

that shortfall (difference), not the full amount of the fire protection revenue reduction and certainly not forever after.

10. Q. DID THE COMPANY GENERATE GROWTH/SAVINGS IN EXCESS OF THE FIRE PROTECTION REVENUE REDUCTION?

A. Yes, and those Growth/Savings are embedded in the Company's cost of service in this rate case. I will address those Growth/Savings later in this testimony.

11. Q. DOES THE ORDER SUPPORT THE EXTRAORDINARY POSITION OF THE AG THAT THE COMPANY'S REVENUE REQUIREMENT SHOULD BE PERMANENTLY REDUCED BY THE REDUCTION IN FIRE PROTECTION REVENUES?

A. No. In fact, the Order contradicts the positions of the AG and other intervenors.

12. Q. WHAT OTHER AREAS IN THE ORDER SUPPORT THE COMPANY'S POSITION?

A. On page 3, the Order states, "Both Tennessee-American Water Company's legal counsel and Mr. L'Ecuyer, on behalf of the company and stockholders, represented that the Company intended to recover the lost margin resulting from the approval of this Tariff by increasing sales of water to existing customers and by gaining new customers. The Company, furthermore, states the approval of a rate reduction for the City of Chattanooga, will

somehow translate into an opportunity to become more competitive and efficient, thereby ultimately resulting in rate payer benefits." On page 4 it says, "The Company (and stockholders) memorialized its conviction by stating its intention to limit margin loss recovery in a manner that has no effect on today's or future rates."

13. Q. HAS THE COMPANY MET THIS "INTENTION"?

A. Yes. Growth/Savings in excess of the reduced fire protection revenue are permanently embedded in this case and more than offset that reduction, thereby offsetting the allocation of fire service revenue to the other classes of revenue as proposed by the Company in this case.

14. Q. DID THE COMPANY RELY ON THIS BASIC RATE MAKING PRINCIPLE AT THE TIME OF THE HEARING BEFORE THE TRA?

A. Yes. The Company understood what would happen to those Growth/Savings under traditional ratemaking practices when other factors drove the need to file for a rate increase. The TRA specifically provided that the Company could offset the rate reduction by Growth/Savings. It is a traditional ratemaking axiom that efficiencies and revenue increases flow through to the benefit of ratepayers every time there is a rate case. Given that, we believe that the clear intent of the Order was that the TRA was

dealing with the specific revenue loss from the hydrant rate reduction as a one-time item. We also believed that prior to the next rate case filing the Company would seek to achieve an offsetting amount of Growth/Savings, the inclusion of which would be embedded in the next rate filing. The Company would then be free to pursue the change in hydrant rates or other alternatives in a cost of service study, but that the revenue reduction would not thereafter be applied in cases against the Company's TRA approved revenue requirement if the Company demonstrated and embedded in its cost of service Growth/Savings in excess of the reduction in fire protection revenue.

15. Q. DO YOU THINK THE COMPANY'S POSITION IS CONSISTENT WITH THE CITY REPRESENTATIONS AT THE HEARING?

A. Yes. We believe the statements of Mayor Kinsey and the City Attorney, Henry Walker, at the hearing support that interpretation of the Order. In fact, those comments crystallize the position of the City, and support the Company's position in this rate case.

16. Q. DID THE TRA INDICATE OR HOLD IN THE ORDER THAT THE PUBLIC FIRE PROTECTION RATES WERE FROZEN OR COULD NOT BE CHANGED IN THE FUTURE?

A. No, the Order is silent about public fire protection rates in future

rate cases. The Order certainly did not indicate that the rates were frozen. The comments of the City at the hearing also did not represent those rates would be frozen in future rate filings.

17. Q. WHAT DID THE COMPANY REPRESENT AT THE HEARING?

A. In order to fully understand those statements it is necessary to review the transcript of the hearing to determine the context in which the Company's statements were made. The Company represented at the hearing that it did not anticipate a rate increase for three or four years, that it would generate Growth/Savings to offset the lower revenue from fire protection, and that factors other than reduced fire protection revenues would drive the need to increase rates.

Those Growth/Savings are embedded in the current rate filing and flow to the ratepayers in the current rate case, thus lowering the overall revenue requirement. The Company believes that it represented that those Growth/Savings would offset the lower fire service revenue when they flowed to the ratepayers in its next rate case.

18. Q. DID THE COMPANY OR THE CITY ARGUE OR AGREE THAT THE COMPANY'S SHAREHOLDERS WOULD BEAR THE COST OF THE REDUCTION IN PUBLIC FIRE PROTECTION REVENUE FOREVER?

A. No. It is clear from the statements and the transcript that the Company and City knew this issue would have to be dealt with in the Company's next rate case, but there was no agreement by the parties that the shareholders would have to bear the cost of the reduced fire protection revenue. This was clear in the statements of both parties at the hearing.

19. Q. WHAT DID THE CITY SAY ABOUT THE TARIFF FILING MADE AS A RESULT OF THE SETTLEMENT WITH CITY?

A. Mayor Kinsey said (transcript beginning on page 17, line 19):

> **"I think that there are - they're not - in the near future they're not doing - they're not coming with any rate increases as a result of this."**

He further stated (beginning on page 18, line 7):

> **"And we - at the point there is a request for a rate change, I would think that, you know, everyone would look at the cost of service of a lot of different things. And I will add that at this point to answer specifically the question about why is this good for the ratepayers, number one, there is no increase in cost to any ratepayer at this point at all. Number two, not only the City of Chattanooga but the cities of Red Bank and East Ridge and many other local governmental entities will be saving a million dollars a year which gets passed on to those ratepayers as citizens and taxpayers."**

20. Q. DO THE MAYOR'S COMMENTS INDICATE A PERMANENT REDUCTION IN THE COMPANY'S REVENUE REQUIREMENT BEYOND THAT REFLECTED BY THE

GROWTH/SAVINGS EMBEDDED IN THIS CASE?

A. No, quite the contrary. Mayor Kinsey indicates there would be no rate increase to any rate payer at this time at all. Our feeling was that the Mayor was not advocating that the Company's stockholders bear a portion of the public fire protection permanently. He said that the Company would not in the near future ask for rate recovery for this reduction, and presumably when other factors drove the need for rate relief a cost of service study should be filed to address this issue. That is exactly what the Company did in this rate filing.

21. Q. DID THE COMPANY OR THE CITY INDICATE THE REDUCTION IN FIRE PROTECTION REVENUE WOULD CONSTITUTE A PERMANENT REDUCTION TO THE COMPANY'S COST OF SERVICE OR THAT PUBLIC FIRE PROTECTION RATES WERE PERMANENTLY FROZEN?

A. No one made those assertions. In fact, Mr. Walker, attorney for the City, said (beginning on page 19, line 24):

> **"Now the question is when they come back for a rate case, whether it's two or three or four years from now, if they feel its appropriate to raise hydrant rates, they can present a cost study, and they can show you at that time that it's not covering their costs, and then you (TRA) can decide what to do about it. The City will be an active participant in that rate case, and we will point out ways in which we think - well, we hope to be able to point out ways in which we think any rate increase could be mitigated."**

22. Q. IS THE COMPANY'S FILING CONSISTENT WITH MR. WALKER'S STATEMENT?

A. Yes, that is how the Company presented this rate case. The City did not argue that the Company should be required to absorb a permanent reduction in its revenue requirement for reduced fire protection revenues beyond the Growth/Savings embedded in this case, or that public fire rates were frozen in future rate cases.

23. Q. WHAT DID THE COMPANY BELIEVE THE ORDER MEANT?

A. We believed that the Company would absorb the cost of lower fire protection revenues to the extent it did not generate Growth/Savings in excess of the reduction until other factors drove the need to increase rates. At that point the Company would file a rate case with those Growth/Savings embedded in the case as an offset to the reduction in public fire protection revenue, thereby offsetting the impact of the fire protection revenue on future ratepayers. That is exactly what the Company has done in its filing in this case. The Company is recommending that a portion of the public fire protection cost, as determined by the cost of service study, be allocated to the other customer classes who directly benefit from that service. This is what is done in some form by most other regulatory jurisdictions.

24. Q. WHAT LANGUAGE IN THE SETTLEMENT AGREEMENT

ADDRESSES THE REDUCTION IN FIRE PROTECTION FEES?

A. The Settlement Agreement states, "TAWC and the City will file a joint petition with the Tennessee Regulatory Authority ("TRA") seeking permission to reduce over a two-year period the current charge of $301.00 a year per fire hydrant to $50.00 a year per fire hydrant at the end of that period. If the TRA does not approve the provision, then this section is null and void."

25. Q. WOULD THE SETTLEMENT WITH THE CITY HAVE GONE FORWARD IF THE AUTHORITY HAD NOT APPROVED THE FIRE PROTECTION PART OF THE SETTLEMENT?

A. Yes, that was the agreement of the parties. The settlement agreement contemplated that the TRA could accept the tariff or deny it. Further, the agreement provided that if the TRA rejected that section of the settlement the remaining sections of the settlement agreement would continue. Further, the parties never agreed or indicated to the TRA that the stockholders should bear the reduction forever or that the parties considered the tariff a permanent reduction of the Company's cost of service.

26. Q. WHAT DID THE COMPANY DO AFTER THE HEARING?

A. The Company filed the tariff approved by the Order and phased in the public fire protection reduction over a two - year period.

27. Q. DID THE TARIFF INDICATE IT WAS PERMANENT?

A. No. As with any tariff, the Company believed it could address this issue in its next rate case and that the tariff was subject to change by the TRA based on the decision of the TRA in a future rate case.

28. Q. WILL THE COMPANY EVER RECOVER ANY OF THE REVENUE LOST DURING THE "STUB PERIOD."

A. No. The revenue lost from reducing public fire protection charges between the date of the Order and implementation of new rates from the current case cannot be recovered. The lost revenue in this "stub period" was approximately $2.256 million (thru 2002, not updated for 2003), and the Company is not currently recovering the revenue and cannot recover that revenue in this case. The Company understood and agreed that it would permanently forego the lost revenue from the stub period when it filed the tariff, and made its representations at the hearing. We believe Mayor Kinsey and Mr. Walker also understood that.

29. Q. DID THE COMPANY UNDERSTAND THE TRADITIONAL RATE MAKING CONCEPT THAT THE GROWTH/SAVINGS FLOWED TO THE CUSTOMERS AFTER A NEW RATE CASE WAS FILED?

A. Yes, the Company understood the concept that Growth/Savings flow the customers once a rate case is filed. However, the Company did <u>not</u> represent that it would also <u>permanently</u> absorb

a significant portion of the cost of providing public fire protection. I believe the Company only represented that it hoped to generate Growth/Savings to offset the fire protection reduction and those Growth/Savings would flow to the customers in its next rate case, and offset the reduced fire protection revenue going forward.

30. Q. CAN YOU PROVIDE AN EXHIBIT THAT RELECTS WHAT THE COMPANY REPRESENTED?

A. Yes. Attached to this testimony is Rebuttal Exhibit MAM-5 that describes what the Company represented.

31. Q. WOULD YOU DESCRIBE THAT EXHIBIT?

A. The Exhibit contains three columns, the first column reflects the revenue in 1999 before and after the fire service revenue reduction. The second column indicates the revenue requirement in this case if the Company had not generated Growth/Savings as represented to the TRA in the hearing. The third column shows the revenue requirement requested in this case of $34.276 million and indicates Growth/Savings of $2.373 million, or $1.336 million more than the reduction in fire service. The Company believes this graph depicts what it represented to the TRA.

32. Q. CAN YOU INDICATE THE NATURE OF THE $2.373 MILLION OF GROWTH/SAVINGS MENTIONED IN THE PREVIOUS ANSWER?

A. Yes. Attached to this testimony are Rebuttal Exhibits MAM-6

and MAM-7 that show the Growth/Savings generated since the last rate case in 1996.

33. Q. IF YOU ADJUSTED THIS GRAPH TO ACCEPT THE ARGUMENT OF DR. BROWN AND THE OTHER INTERVENORS, WHAT ADJUSTMENTS WOULD YOU MAKE?

A. Column three would have to be adjusted to reflect the revenue reduction in addition to the Growth/Savings, and the purple box (reduction in fire service revenue) would have to be moved below the $34.276 million revenue requirement requested in this case. The Company did not represent that at the hearing. That approach is also not consistent with the Order in that it provides both benefits to the customer, not either, or as indicated on page 4 of the Order. That adjustment would effectively eliminate any opportunity for the Company to achieve its authorized ROE granted in this case. Obviously this graph must be adjusted to reflect the actual revenue requirement granted in this case, but the impact would be the same.

34. Q. IS THE POSITION OF THE AG AND OTHER INTERVENORS DESCRIBED CONSISTENT WITH THE ORDER?

A. No. Using the Growth/Savings and eliminating the recovery of the cost of service based charge for public fire service from the municipalities or from the other classes of customers who directly

benefit from that service penalizes the Company beyond the contemplation of the Order. We do not believe that the Company or the City ever advocated or represented this "double impact" to the TRA.

35. Q. WOULD THE POSITION OF THE AG AND OTHER INTERVENORS HAVE A NEGATIVE LONG-TERM IMPACT ON THE COMPANY AND ITS CUSTOMERS?

A. Yes. This would effectively place the Company in what is commonly referred to in the ratemaking environment as a "death spiral." In order to have any opportunity to achieve its authorized ROE, the Company must <u>again</u> generate more Growth/Savings, and those would <u>again</u> flow to the ratepayers in the next rate case. The fact is there simply is a point beyond which the Company can no longer generate Growth/Savings. At that point service suffers and the Company's credit worthiness declines. The Company will not be able to attract low cost debt or additional equity to fund capital improvements. The Company certainly did not advocate this scenario and does not believe it was the intent of the City or the TRA Order to place the Company in that position. This situation would not be in the best long-term interests of the Company or its customers.

36. Q. DR. BROWN REFERS TO SEVERAL STATEMENTS FROM

THE TRANSCRIPT AND ORDER IN HIS TESTIMONY. DO YOU AGREE WITH HIS CHARACTERIZATIONS OF THE RECORD?

A. No; however, the comment on page 6, lines 19-33 of his testimony requires some clarification. Dr. Brown provides quotes of the exchange between Director Greer and the Company representatives. His is correct that there was a long discussion between Director Greer, Mr. Pappas, and Mr. L'Ecuyer. In this exchange Director Greer asked several times in different forms how this revenue loss will be handled. In that entire exchange the Company indicated in a consistent message that the Company would offset the lost revenue with Growth/Savings until other factors drove the need to increase rates. I believe based on the transcript the Company was consistently referring to the "stub period" in this exchange. Not once did the Company indicate it was representing a permanent revenue requirement reduction during this exchange.

37. Q. IS THE QUOTE USED ON PAGE 6, LINE 32-33 COMPLETE?

A. No. Dr. Brown quoted Mr. Pappas: "This particular loss will – is not occasioned for a rate increase." However, Dr. Brown failed to include the remainder of Mr. Pappas' statement. In the next sentence Mr. Pappas said: "We are trying to take care of this by two things: Increase the sale of water to our existing customers;

try to pick up new customers." Mr. Pappas discussed further the 800 acre Volunteer Site and how one new, large customer could offset the reduction. In the last paragraph of this response, Mr. Pappas stated there were no plans at the present time to recover this by a rate case, but he made it equally clear that he was not telling the TRA within 3-5 years the Company would not file for a rate increase that could be occasioned by something else.

38. Q. WHY DO YOU BELIEVE DR. BROWN HAS USED ONLY A PORTION OF THIS EXCHANGE?

A. I can't speak for Dr. Brown's intent, but his selective use of the transcript seems to imply that the Company was agreeing to a permanent reduction in its cost of service for the public fire protection revenue reduction. In fact, in the context of the entire exchange, the Company did not represent anything other than its intent to increase revenue during the "stub period" and that other factors would drive the need to increase rates. I indicated earlier in my testimony that it is critical to understand what the Company represented at the hearing and keep those representations in the context of the entire exchange.

39. Q. DR. BROWN ARGUES THAT YOUR DIRECT TESTIMONY DOES NOT PROVIDE AN ACCURATE VERSION OF THE ECONOMICS OF THE AGREEMENT WITH THE CITY. DO YOU AGREE WITH HIM?

A. No. As the Treasurer and Comptroller of the Company I understand the economics of the agreement very well. I have provided language from the settlement agreement, the representations of the Company and the City at the hearing, and the Company's position on this issue. The economics of the settlement agreement are that the Company agreed to file a tariff to lower public fire protection revenue over a two - year period. It was a way of paying the City $1.1 million (and then only if approved by the TRA), and certainly not a perpetual annual amount that would equate to untold millions. The agreement in no way indicated this reduction was permanent or that the Company could not seek to increase the tariff in future rate cases. There are no statements in the transcript that support Dr. Brown's extraordinary position that the Company agreed to absorb a portion of the reduced public fire protection revenue permanently after the "stub period" ended with approved rates from a future rate case.

40. Q. DO YOU HAVE ANYTHING FUTHER TO SAY ABOUT YOUR UNDERSTANDING OF THE ECONOMICS OF THE SETTLEMENT?

A. It is inconceivable to me that anyone could assert as settlement to the lawsuit with the City the Company agreed to pay the City $1.1 million for as long as it does business in Chattanooga (in

perpetuity). I don't believe given the comments of the City and the Company at the hearing that was ever contemplated and we don't believe that was the intent of the TRA. For Dr. Brown to assert that the Company agreed to a permanent annual payment to the City, or that the Agreement contemplated or indicated that position is unreasonable. Admittedly, he and I are not lawyers, but I believe we both know his interpretation of the Order as expressed in his testimony is inconsistent with what was held in the Hope and Bluefield Gas cases. Dr. Brown's interpretation of the Order would place the Company in a position where it would not have an opportunity in this case, or any future rate cases, to achieve a fair and reasonable return on its investments.

41. Q. DR. BROWN ASSERTS IN ANSWER TO QUESTION 16 OF HIS TESTIMONY THAT THE SETTLEMENT AGREEMENT ESTABLISHED A PERMANENT FLOW OF RESOURCES TO THE CITY. DO YOU AGREE?

A. No. I fail to understand how Dr. Brown can assert that the settlement agreement provided a permanent annual payment when the Agreement i) was subject to TRA approval, ii) provided no mention of this being a permanent reduction or that the Company would permanently absorb the cost of fire protection, and, iii) made no mention of freezing those rates permanently. This assertion by Dr. Brown is inconsistent with the clear

representations of Mayor Kinsey and Henry Walker at the hearing stating that i) there was no rate increase at this point at all, ii) the Company is free to seek an increase in the fire service rate in a future rate case, and iii) the Company should prepare a cost of service study to address this issue in its next rate case.

42. Q. **WOULD YOU ADDRESS THE COMMENTS OF DR. BROWN THAT THE RECORD DOES NOT INDICATE ANYTHING OTHER THAN THE REDUCTION IS PERMANENT?**

A. Dr. Brown asserts the record provides no indication that the Company's resource transfer is anything other than permanent. As this rebuttal testimony indicates, the settlement agreement, the transcript of the hearing and the Order contain numerous indications and statements that support the Company's position.

43. Q. **DR. BROWN ASSERTS THAT THE COMPANY'S COST OF SERVICE STUDY AFFIRM'S THE COMMITMENT TO TRANFER $1.1 MILLION TO THE CITY ANNUALLY. DO YOU AGREE?**

A. No. The Company believes that the City and the Company understood that Growth/Savings presented the only offset to the Company for the reduced fire protection revenue in the "stub period." Further, under standard ratemaking, once a rate case is filed the Growth/Savings become embedded in the Company's cost of service. Rebuttal Exhibit MAM-5 shows that the revenue

requirement in this case has already been reduced in excess of the reduced fire protection revenue. This is consistent with the Order, and the Company and City's representations at the hearing.

44. Q. DO YOU BELIEVE THAT THE COST OF SERVICE ALLOCATIONS CONFIRM THE COMPANY'S COMMITTEMENT TO TRANSFER $1.1 MILLION TO THE CITY ANNUALLY?

A. As Exhibit MAM-5 reflects, the Company embedded in this case Growth/Savings in excess of the reduced fire protection consistent with the Order and the Company's representations. That does not eliminate the need to allocate the $34.276 million revenue requirement requested by the Company (or the revenue requirement ultimately determined by the TRA). The Company has proposed and requested the TRA to consider allocating its cost of service based on a cost of service study and tariff design prepared by Paul Herbert on behalf of the Company. That study determined that the cost of public fire service was $1.473 million. The Company believes it is free to propose allocating that entire amount to the municipalities based on the settlement agreement, as confirmed by the statements of Mayor Kinsey and Henry Walker at the hearing, and the Order (which is silent on future increase in public fire service tariffs). The Company chose to

propose a 25% cap of full cost of service to the municipalities, with the remainder allocated to the other classes who directly benefit from this service.

45. Q. IS THIS AN ADMISSION OF A PERMANENT TRANSFER OF ASSETS TO THE MUNICIPALITIES, OR AN ADMISSION THAT THE COMPANY SHOULD ABSORB A PORTION OF THE COST OF PUBLIC FIRE SERVICE PERMANENTLY?

A. As I testified in my direct testimony, most regulatory jurisdictions do not pass the full cost of service for public fire protection to the municipalities, but instead place all or a portion of those costs on the other customer classes who benefit directly from that service. The Company believes its proposed allocation places a portion of that cost on the customers who directly benefit from the service, and that this allocation is a reasonable way to recover fire protection charges, as recognized in some form by most other regulatory jurisdictions.

This cost of service allocation proposed by the Company in this case is mistakenly interpreted by Dr. Brown as a commitment by the Company to make a permanent transfer to the City that was never contemplated in the agreement, represented by the City or the Company at the hearing, or included in the Order. The Company has simply asked the TRA to consider an alternative cost of service allocation method consistent with most other

jurisdictions.

46. Q. IS THERE A DISTINCTION BETWEEN OVERALL REVENUE REQUIREMENT AND THE ALLOCATION ISSUE OF THE COST OF SERVICE STUDY THAT MIGHT BE CAUSING CONFUSION ON THIS ENTIRE ISSUE?

A. I believe there is. The Company represented at the hearing a revenue requirement offset when those Growth/Revenues became embedded in its cost of service in its next rate case. I believe the Company has demonstrated that revenue requirement has been decreased in excess of the reduced fire protection, and the Company believes this is consistent with its representations and consistent with the Order.

How to allocate that cost of service (already reduced for those Growth/Savings) is a separate issue. The AG's position that the approved cost of service based revenue requirement should be lowered further for the reduced fire protection revenue is inconsistent with what the Company represented and inconsistent with the intent of the Order.

The Company believes that it must allocate its entire revenue requirement with those Growth/Savings embedded, otherwise it has no offset to the reduced fire service revenue. The AG's position would effectively require the Company to absorb a portion of the cost of fire protection permanently, unless it is

permitted to retain a level of Growth/Savings to offset the unallocated cost of public fire protection. This position of the AG is simply not in the best interests of the customers over the long-term, and the Company does not believe that position was the intent of the TRA in its Order.

47. Q. DO YOU HAVE ANY COMMENTS ABOUT THE TESTIMONY OF CMA WITNESS RAY CHILDERS?

A. Yes. Mr. Childers alleges that the Company's position in this filing is unconscionable and that the Company is attempting to renege on the promises made to the TRA, the City, and the ratepayers. The fire service Order, and the issues surrounding the Order are complex. Careful reading of the Order in its entirety, and analysis of the representations of the Company and the City, particularly the comments of Mayor Kinsey and Henry Walker, indicate that the Company actions in this case are consistent with the Order. The comments of Mayor Kinsey and Henry Walker at the hearing clearly indicate the City's understanding of the settlement. The Company certainly does not believe it has reneged on the settlement and believes its filing is consistent with the City's representations at the hearing.

48. Q. DO YOU HAVE ANY COMMENTS ABOUT THE TESTIMONY OF THE OTHER CMA WITNESSES, MR. CANTRELL, MR. CROWDER, AND MR. NUCKELS?

A. Yes. While the Company can sympathize with the testimony of the CMA about increased costs, it is unfair to indicate their entire competitive position rests with the water rates. The Company has not increased rates in over seven years. The Company has also experienced cost increases for such items as wage increases, benefit costs, insurance costs, property taxes, increased capital investment, and other inflationary trends. The Company has taken significant measures to control costs, including having 20 fewer employees in operations and moving to a national call center and shared service functions.

There are differences in market driven companies and utilities other than price setting regulation. Utilities have a public service obligation driven by rules and regulations on service quality, water quality, extension of service, and various other regulatory requirements. The Company cannot change its rates without prior approval or cut costs below the point where it is able to meet its public service obligation. There comes a time when increased rates are necessary in order to meet that public service obligation.

49. Q. HAVE YOU LOOKED AT THE INDUSTRIAL RATES IN OTHER AREAS OF TENNESSEE AND ADJACENT AREAS?

A. Yes. For a small industrial customer using 1.4 million gallons per month the proposed industrial rates in this case for the

Chattanooga area are 17% lower than Nashville, 21 higher than Knoxville in City rates, 1% higher than Knoxville out of City rates, 13% lower than Atlanta's in City rate, and 33% lower than Atlanta's out of City rates

For larger industrial customers using 15 million gallons per month, Chattanooga rates are 65% lower than Nashville, 8% higher than Knoxville in City rates, 12% lower than Knoxville out of City rates, 82% lower than Atlanta in city rates, and Atlanta out of City rates are 114% higher than Chattanooga. I believe the analysis above demonstrates the Company's industrial rates are very competitive with other major Tennessee water systems.

50. Q. DO YOU HAVE ANY COMMENTS REGARDING THE TESTIMONY OF MR. KINSEY?

A. Yes. Mr. Kinsey does not dispute the Company position in this filing. Mr. Kinsey indicates specific questions regarding whether the Company understood this reduction would always be borne by the stockholders, never the rate payers. Again, it is critical to review the comments of the Company to these questions in the full context of the answers. The Company believes its filing is consistent with what it represented at the hearing and consistent with the Order. As stated by Mr. Kinsey at the hearing, the taxpayers (customers) received the benefit of reduced taxes or avoided tax increases, and in this case the ratepayers get the

benefit of the Growth/Savings. It was never indicated by the Company or the City that the ratepayers would get both benefits. The comments of the Company, and particularly the comments of Mr. Kinsey and Henry Walker certainly never indicated the Company would have to bear all or a portion of the reduced fire protection permanently.

51. Q. WOULD YOU COMMENT ABOUT MR. KINSEY'S POSITION ON THE INCREASE TO PUBLIC FIRE PROTECTION IN THIS CASE?

A. Yes. Mr. Kinsey indicates he believes the Company was free to raise public fire service rates, however, he is surprised by the 43.9% increase. This is the cost of service issue mentioned earlier (not the revenue requirement issue), and the Company does not propose to allocate all of the cost of providing public fire service to the municipalities. The method proposed is to limit the amount recovered from the municipalities to 25% of cost of service as Pennsylvania has done. In my direct testimony, I addressed various methods of allocating public fire service used in other jurisdictions. The Company is open to any reasonable method of setting public fire rates below full cost of service as long as it is clearly understood that the Company can allocate the unrecovered amount to the other classes, as is done in each jurisdiction listed in my direct testimony.

52. Q. DR. BROWN MAKES REFERENCE AND PLACES SOME IMPORTANCE ON THE COMPANY'S DIVIDEND PAY OUT FROM 1999 EXCEEDING EARNINGS. WHAT IS THE COMPANY'S DIVIDEND POLICY AND WHY WAS 1999 NOT A TYPICAL YEAR?

A. The policy is established by the Board of Directors, and the policy is to pay dividends at 75% of calendar year earnings. Dividends are paid one quarter in arrears. The dividend pay out in 1999 is not typical, and the dividend exceeding 100% of earnings is created solely due to timing of the payments. The declared dividends for the four quarters of 1999 equal 75% of 1999 earnings. Because the payments are being made one quarter in arrears, the 1999 dividend referenced by Dr. Brown includes the dividend payments for the fourth quarter 1998 and the first three quarters of 1999. The earnings for 1999 are not typical due to the recording of condemnation expenses. Mr. Moul will address the significance of this issue raised by Dr. Brown.

53. Q. DO YOU HAVE COMMENTS ON THE ROE RECOMMENDATIONS OF THE AG AND CITY?

A. Yes. As indicated in the rebuttal testimony of Mr. Moul, both recommendations have serious flaws in the methods utilized and produce a result that is unrealistic, particularly in relation to comparisons to awards in other jurisdictions. The 9.21% ROE

recommended by Dr. Brown is unrealistic and when his weighted overall cost of capital is applied to the capital structure of the Company it produces an ROE of 8.4%.

54. Q. WOULD A COMPARISON OF THE LATEST AUTHORIZED ROE'S OF OTHER AMERICAN WATER SUBSIDIARIES PROVIDE A MEANINGFUL COMPARISON?

A. It is certainly a practical and valid consideration for the Commission. The Company has had a need for outside funding in order to finance the capital expenditures it has undertaken over the past seven years and will undertake in the future. That capital investment is one of the primary reasons for the rate increase requested in this case. The equity portion of that additional permanent capital is supplied by the Company's parent, American Water. The Company should be allowed to maintain a strong financial position and capital structure in order to compete with other alternatives for the equity capital supplied by American Water, and debt capital in the market at reasonable rates.

55. Q. HOW DOES THE AG'S RECOMMENDED RETURN ON EQUITY COMPARE TO THAT OF OTHER AMERICAN WATER WORKS SUBSIDIARIES AT THIS TIME?

A. Attached to this testimony is Rebuttal Exhibit MAM-8 which compares the currently authorized ROE's of the American Water

operating subsidiaries to the "Value Line Publication" rates for A-rated utility bonds at the time of the hearing on each case for those operating subsidiaries. The Exhibit shows the spread between authorized ROE and the A-rated utility bonds. The Exhibit also includes a projection of the ROE requested by the Company based on the current projected Value Line 30-year T-Bond rate for 2004 plus a projected spread between 30-year T-Bonds and A-rated utility bonds. It is important to note that no other American Water operating subsidiary is currently authorized an ROE remotely comparable to the fall-out ROE to the Company of 8.4% recommended by the AG. This information is based on the seven American subsidiaries that have received rate orders since January 2001.

56. Q. WHAT IS THE COMPANY'S POSITION ON THE RETURN ON EQUITY FOR THE COMPANY?

A. The Company believes that its authorized rate of return, using the Company's capital structure, should be in line with the returns on equity granted other American Water subsidiaries if it is to continue to attract equity, and attract debt at reasonable rates.

57. Q. WHAT IS THE COMPANY POSITION ON DOUBLE LEVERAGE?

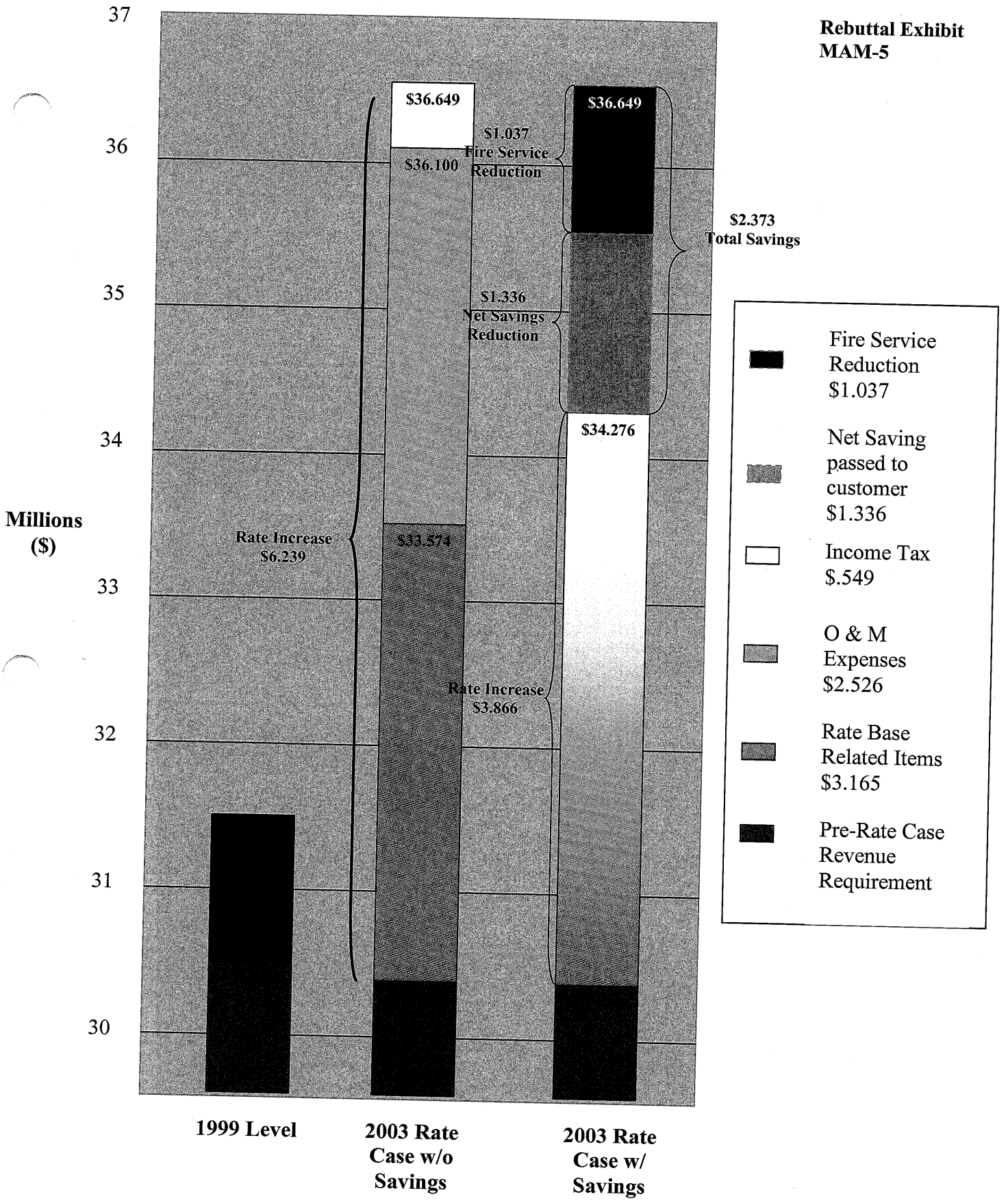
A. The Company does not believe applying a double leverage capital structure in determining the Company's ROE produces the true

cost of equity for the Company as Mr. Moul indicates in his testimony. Mr. Moul recommends that the TRA's first adjustment to the AG's recommended ROE should be to elevate that ROE for the DCF adjustments related to appropriate utilization of that method and its various components and projections. However, if the TRA elects to continue its practice of applying double leverage, it should also include an additional risk premium to reflect the additional financial risk as indicated by Mr. Moul. In addition, Company believes that it should be permitted to allocate a portion of the public fire protection revenue as proposed in this case. The Company believes this position is supported by the Company and City's representations and the Order. If the TRA elects not to accept the Company's position, it should consider adjusting the Company's cost of service to permit the Company to retain an appropriate portion of Growth/Savings as an offset to the unallocated cost of public fire protection. The Company believes this approach would be consistent with the Company' representation and the Order. If the TRA ultimately adopts the AG's position on public fire service allocation, the TRA should add a third adjustment to the AG's recommended overall cost of capital to reflect the additional business risk associated with that decision as indicated by Mr. Moul.

58. Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?

A. Yes.

Rebuttal Exhibit MAM-5



Tennessee-American Water Co.
Revenue Requirement

Tennessee-American Water Company
Revenue and Productivity Gains

Rebuttal Exhibit MAM-6

Labor:		
Labor Expense in Current Case	5,066,666	
Labor Overhead Rate	1.49	
Labor with Labor O/H (group ins., pensions, FICA, 401k, FUTA, etc.)	7,549,332	
Number of Employees Previous Case		155
Less: Employees offset by Call Center and Shared Services Costs		16
Total Employees, net of Shared Services		139
Employees in Current Case & Comparable in Previous Case	119	139
Reduction of Employees from Normal Operations		(20)
Average Cost per Employee Current Case	**63,440**	
Reduction of Employees from Normal Operations since previous case	**20**	
Labor & labor O/H Savings since Last Case	**1,268,795**	
Revenue Growth Since 1996 Case per Rebuttal Exhibit MAM-6	**661,682**	
Net Savings from Customer Call Center and Shared Services Center per Direct Exhibit MAM-4	**194,992**	
Savings in Interest Expense Since 1996 Case	**247,972**	
Identifiable Growth/Savings Since 1996 Case	**2,373,441**	

Tennessee-American Water Company
Growth In Revenues

Rebuttal Exhibit MAM-7

	Current Case @ Present Rates	1996 Case Authorized Rates	Growth Since Previous Rate Case
Revenues:			
Residential	12,026,923	12,069,890	(42,967)
Commercial	9,180,456	7,836,468	1,343,988
Industrial	3,537,807	4,132,090	(594,283)
Other Public Authority	2,345,806	2,172,786	173,020
Other Water Utility	856,218	366,511	489,707
Private Fire	1,117,875	949,669	168,206
Public Fire	256,049	1,293,697	(1,037,648)
Other Operating Revenues	1,088,221	926,562	161,659
Total Operating Revenues	**30,409,355**	**29,747,673**	**661,682**

Tennessee-American Water Company
Comparison of Authorized ROE's - American Water Subsidiaries

Rebuttal Exhibit
MAM-8

Company:	Order Date	Authorized ROE	Value Line "A" Utility Bonds	Date	Spread over "A" Util. Bonds
California-Am.	2/23/2003	10.25%	6.84%	APR. 03	3.41%
Illinois-Am.	2/21/2001	10.20%	7.66%	JAN. 01	2.54%
Iowa -Am.	8/20/2001	10.45%	7.58%	JUI. 01	2.87%
Kentucky-Am.	5/9/2001	11.00%	7.43%	MAR. 01	3.57%
Missouri-Am.	5/18/2001	10.75%	7.43%	MAR. 01	3.32%
Pennsylvania-Am.	1/25/2002	10.60%	6.98%	NOV. 01	3.62%
Virginia-Am.	7/20/2001	10.75%	7.79%	MAY. 01	2.96%
Indiana-Am.	11/6/2002	10.50%	6.76%	SEP. 02	3.74%
Ohio-Am.	2/7/2002	10.30%	6.84%		3.46%
Averages		10.53%	7.26%		3.28%

Conclusion:

Value Line "A" Utility Bonds projection based on 2004 Projected 30 Yr. T-Bond plus 2.00 % Spread	7.10%
Average Spread of AWW Companies	3.28%
ROE Calculated on Average Spread	**10.38%**

STATE OF NEW JERSEY

COUNTY OF CAMDEN

AFFIDAVIT

BEFORE ME, the undersigned authority, duly commissioned and qualified in and for the State and County aforesaid, personally came and appeared Paul R. Moul, who, being by me first duly sworn deposed and said that;

He is appearing as a witness on behalf of Tennessee-American Water Company before the Tennessee Regulatory Authority, and if present before the Authority and duly sworn, his rebuttal testimony would set forth in the annexed transcript.

Paul R. Moul

Taken, subscribed and sworn to before me this 20th day of June, 2003.

My commission expires May 12, 2004

Notary Public

Notary Public of New Jersey
I.D. #2165661 Com. Exp. 5/12/04
Ruby Marie Tucker

Exhibit PRM-3

BEFORE THE

TENNESSEE REGULATORY AUTHORITY

TENNESSEE-AMERICAN WATER COMPANY

Case No. 03-00118

REBUTTAL TESTIMONY OF PAUL R. MOUL

CONCERNING THE
COST OF EQUITY
AND
RATE OF RETURN

Tennessee-American Water Company
Rebuttal Testimony of Paul R. Moul
Table of Contents

PREPARED REBUTTAL TESTIMONY OF PAUL R. MOUL

Q. Please state your name and business address.

A. My name is Paul Ronald Moul and I am managing consultant at P. Moul & Associates. My business address is 251 Hopkins Road, Haddonfield, NJ 08033-3062.

Q. Have you previously submitted testimony in this proceeding?

A. Yes. My direct testimony was included as part of the Company's case-in-chief that was filed on February 7, 2003.

SCOPE OF TESTIMONY

Q. What is the purpose of your testimony?

A. Tennessee-American Water Company ("TAWC" or the "Company") has requested that I respond to the testimony submitted by Dr. Steve N. Brown, a witness appearing on behalf of the Consumer Advocate and Protection Division of the Office of the Attorney General ("AG"), and Mr. Marlin L. Mosby, Jr., a witness appearing on behalf of the Intervenor, City of Chattanooga ("Chattanooga").

Q. Have you prepared an exhibit to accompany your rebuttal testimony?

A. Yes. Exhibit PRM-4 that consists of eight (8) schedules was prepared in connection with my rebuttal testimony.

TESTIMONY OF THE OPPOSING WITNESSES

Q. Will you identify the areas of controversy as it relates to the testimony of the opposing witnesses?

A. The central areas of dispute concerning the rate of return issue in this case involve: (i) whether the capital structure and cost of equity proposed by the opposing witnesses will be acceptable to the financial community and support reasonable credit quality; (ii)

whether a hypothetical capital structure, or one linked to TAWC's parent company is reasonable for ratesetting purposes, (iii) the proxy group of companies that should be considered in measuring the cost of equity, (iv) the determination of a reasonable cost of equity using the DCF model, and (v) the impact on the Company's risk concerning non-compensatory fire service being offered to the City of Chattanooga. For the reasons that follow, it is my opinion that the cost of equity proposals by the witnesses representing the AG and Chattanooga are too low by reference to returns being granted by other regulatory agencies and those expected by investors. Further, the proposal submitted by the AG is not adequate to support the Company's credit quality.

Q. Why, in your view, are the proposals by the AG and Chattanooga too low to provide an equity return that fulfills the test of reasonableness?

A. The Company must have a rate of return that is adequate by reference to alternative investment opportunities and must support reasonable credit quality. The Bluefield and Hope decisions require that these standards be met in a rate of return determination. It is my opinion that the proposals of the opposing parties are too low by reference to alternative investment opportunities and would not support reasonable credit quality. Moreover, a rate of return on common equity of 9.21%, as proposed by the AG, and 8.16% to 9.65%, as proposed by Chattanooga, are much too low by reference to the rates of return being provided to other utilities in rate case proceedings.

Q. Do you have evidence that shows that the proposed rates of return on common equity by the AG and Chattanooga are too low?

A. Yes. I have provided the forecast returns on equity for the water utility industry that are published in Value Line. As shown on Schedule 1 of Exhibit PRM-4, the returns are:

Years	Industry Composite
2003	10.0%
2004	11.0%
2006-2008	12.0%

Investors have knowledge of these returns, and price the stocks of the water utilities accordingly. Returns less than 10% are simply not acceptable to investors.

Q. Can you demonstrate how a return on equity below 10% is unusual in public utility ratesetting?

A. Yes. From my experience, single digit returns (i.e. those less than 10%) are very unusual. As shown on Schedule 2 of Exhibit PRM-4, the PUR Utility Regulatory News ("URN") issue dated November 29, 2002, provides the annual survey of regulatory authorized rates of return on common equity. The survey results show that single digit (i.e., below 10%) rates of return on common equity are very unusual. The distribution of the returns were:

	Number	Percent
Less than 10%	1	2%
10% to 10.9%	8	16%
11% to 11.9%	26	53%
12% to 12.9%	10	20%
Higher than 13%	4	8%

The average authorized rate of return on common equity was 11.45%, the median return was 11.25%, and the midpoint return was 11.80%. These data are taken from decided rate cases and show that returns below 10% are unusual for energy utilities.

Q. Since the URN survey focused upon energy utility rate case decisions, what is your experience for water utilities?

A. During the year 2002, there were two rate case decisions for water utilities in which I participated. In its rate case decision dated January 10, 2002, the Pennsylvania Public

Utility Commission set the rate of return on common equity at 10.6% for Pennsylvania-American Water Company (Docket No. R-00016750). Subsequently, on August 1, 2002, the Pennsylvania Public Utility Commission set the rate of return on common equity at 10.7% for Philadelphia Suburban Water Company (Docket No. R-00016750). My experience indicates that rates of return on common equity less than 10% are unusual for water utilities.

Q. Do you have additional evidence concerning the authorized returns for other water companies?

A. Yes. The rebuttal testimony of Mr. Michael Miller provides those returns. For the past several years, the returns established by the regulatory agencies for American Water subsidiaries have exceeded 10.0%.

Q. Mr. Mosby also presents earned returns on equity by water utilities as part of his analysis. Please comment on his approach.

A. It has been over a quarter-century since I have seen a rate of return witness propose that the historical earnings of another regulated company, the company itself, or an affiliate should provide the basis for the rate of return in a rate case. The approach does not conform with modern concepts of a fair rate of return. The approach proposed by Mr. Mosby has been supplanted by modern methods for determining a cost of equity because: (i) his approach is accounting related, (ii) his approach is not a market-based approach, and (iii) his approach does not conform with the prospective nature of public utility ratesetting.

Essentially, Mr. Mosby advocates an approach that is based on backward looking accounting returns that are the product of regulatory-determined pricing of utility

service. This approach involves circular reasoning because the historical returns arise from past regulatory actions. Suffice it to say, the approach advocated by Mr. Mosby has not been used in public utility ratesetting for many years because it incorporates past rate case decisions as a basis to determine the return in a rate case.

Q. If this approach were to be considered by the Authority in this case, how should the returns be determined?

A. The only way to remedy Mr. Mosby's approach would be to use expected returns. As I previously demonstrated, those returns are forecast to be in the 10% to 12% range. Unlike Mr. Mosby's approach, these expected returns accommodate the realities that future performance will likely diverge from past experience. Moreover, they also recognize that public utility ratesetting is prospective in nature, as shown by the rate year procedures used by the Authority to establish revenue requirements.

Q. Dr. Brown provides data for earned returns on Exhibit CAPD-SB 2 that purport to support his cost of equity proposal. Please respond.

A. No conclusions can be drawn from the table of values shown on Exhibit CAPD-SB 2. The reason that these returns are not useful is that they provide a biased representation of corporate returns expected by investors. These returns are biased because they are taken from a period of cyclical weakness in the economy. Indeed, if we were in a cyclical expansion of the economy, I seriously doubt that Dr. Brown would be utilizing these types of data for any purpose. Indeed, a longer term and more representative view of earned returns are shown below for 702 major industrial companies.

Year	Return	Year	Return
1993	16.4%	1999	18.0%
1994	18.1%	2000	18.2%
1995	19.3%	2001	13.5%
1996	18.9%	2002	12.5%
1997	20.0%	2003	14.0%
1998	19.0%	2005-07	16.5%

These returns indicate that the data presented by Dr. Brown does not reflect a representation of earnings expected by investors. This assessment is buttressed by the fact that the Bureau of Economic Analysts ("BEA") of the U.S. Department of Commerce reported that profits before tax increased $24.6 billion in the first quarter of 2003 compared with an increase of $26.4 billion in the fourth quarter of 2002. The returns shown on Exhibit CAPD-SB 2 are obviously biased and cannot be used for any purpose.

Q. Can you demonstrate how the AG's proposal would inhibit the Company from attaining reasonable credit quality?

A. Yes. In order to fully assess the credit quality implications of its recommendation, it is necessary to analyze their capital structure proposals. Credit quality support arises from both the degree of financial leverage imputed to a utility, as well as the return on equity, which provides the margin above one-time fixed charges (that is to say, the equity return provides earnings protection to lenders above interest charges alone).

Since AG witness Dr. Brown has imposed a capital structure different from the Company's actual capital structure, it could be viewed as a hypothetical. While Dr. Brown devotes considerable testimony to the parent company-subsidiary relationship, he essentially adopts an industry-wide, generic capital structure and uses it as a proxy for TAWC's parent company. Expressing Dr. Brown's capital structure proposal presented

on Exhibit CAPD-SB 16 in a broad context, he proposes a 58.4% debt ratio (6.2% Company short-term debt, 20.8% Company long-term debt and 31.4% parent company debt), 1.6% preferred stock, and 40.0% common equity. Details of these ratios, and the costs assigned to each capital component are shown on Schedule 3 of Exhibit PRM-4.

I have listed below the pre-tax interest coverage benchmarks established by Standard & Poor's Corporation ("S&P"), one of the major bond rating agencies, and the credit quality measures that are implicit in the proposal by the AG. Pre-tax interest coverage is important because the credit rating agencies and other lenders employ coverage when measuring earnings protection for creditors. The comparisons are shown below:

	Interest Pre-Tax Coverage
"AA" Criteria by S&P	**3.4 - 4.0x**
"A" Criteria by S&P	**2.8 - 3.4x**
"BBB" Criteria by S&P	**1.8 - 2.8x**
AG's proposal	2.66x

Q. What do you conclude from the comparison shown above?

A. The goal of an A credit quality rating is the appropriate objective for the Company because it is the rating that predominates the water utility industry. For the return to be fair to the Company, its credit quality profile should be no less than that of the proxy group used to measure the Company's cost of equity. Based upon the proposal of the AG, the pre-tax interest coverage is unsupportive of reasonable credit quality for TAWC. The comparisons indicate that the proposal of the AG would result in subpar pre-tax interest coverage for the A rating financial profile. The Company should be afforded an opportunity to experience pre-tax interest coverage well within the range of

2.8 times to 3.4 times. The proposal by the AG's witness inhibits the achievement of this goal.

PARENT-SUBSIDIARY RELATIONSHIP

Q. AG witness Dr. Brown indicates that the parent-subsidiary relationship must be considered in the rate of return for TAWC. Is this generally accepted in public utility ratesetting?

A. No. In my twenty-nine (29) years experience, the so-called "double leverage" approach that explicitly reflects the parent-subsidiary relationship is unusual. There are very few state regulatory commissions that use this approach as a matter of policy. Moreover, several regulatory agencies that previously considered the "double leverage" approach have moved away from using this technique to calculate the utility's rate of return. The "double leverage" approach is not widely used today because of the proliferation of holding company corporate structures in the energy industry. While at one time, the holding company corporate structure was most prevalent in the water and telecommunications industry that operated in multiple jurisdictions (as well as public utility holding companies under the 1935 Act), almost every public utility now has a holding company affiliation. Indeed, only two of Dr. Brown's proxy group of twelve water companies have traded stock without a holding company corporate structure. Even very small, rather obscure water companies, such as Artesian, Birmingham, and Pennichuck have holding company corporate structures. This situation has also become very common for energy utilities during the past several years. These structures have been acceptable to regulators because they offered ratepayer protection from the risks associated with non-utility endeavors.

Q. Is the "double leverage" approach usually employed in the other state jurisdictions where American Water operates?

A. No. Of the states that I am familiar, "double leverage" is not usually employed. Rather, the subsidiary's actual stand-alone capital structure is used in Pennsylvania, New Jersey, Virginia, West Virginia, Kentucky and Illinois.

Q. What are the conceptual problems with the "double leverage" procedure that make it inappropriate for this case?

A. There are a host of reasons that indicate that "double leverage" is both discriminatory and unfair to the utility. A fundamental flaw of the "double leverage" concept is that it bases the return of the subsidiary on the source of funds of the investor, rather than the return that is commensurate with the risk of the utility, as required by the Hope and Bluefield decisions. This is unfair, unreasonable, and discriminatory because the relevant cost of capital should be related specifically to the operating subsidiary and should be based on the riskiness of the subsidiary, not its parent. The concept suggests that all subsidiaries have the same risk as the parent company, which we know is not true (under that presumption, cross-subsidization is encouraged). Rather, the rate of return should be reflective of the risk to which the utility's capital is exposed, and not to the identity of its stockholder.

When a holding company's corporate structure is not present, it is not possible to determine the source of funds used by individual stockholders to finance their stock purchases (indeed, it would be impractical, if not impossible to know which stockholders purchased shares on margin and what their margin financing costs were). Further, if an individual acquired his/her stock or the funds to buy the stock through inheritance, as a

gift, or with proceeds from lottery winnings, the "double leverage" concept would argue their cost of equity would be zero. Of course, this presumption is incorrect because the cost of equity is founded on the opportunity cost to investors, and not how the equity was acquired.

In addition, if the subsidiary was sold to a new corporate parent with different capital costs, then suddenly the utility would have a new rate of return although the risk of assets do not change. Dr. Brown never addresses the issue of whether the cost of capital to RWE increased, decreased, or was the same as American Water before the acquisition. A change in the rate of return for these reasons would be unwarranted because risk associated with the assets used to provide service to Tennessee water customers does not change due to a change in ownership.

Consider as another example, a utility with both a corporate parent and minority interest held by outside investors. It would be manifestly unfair to burden the minority interest investor with the corporate parent's cost of capital or to discriminate by establishing two different costs of equity -- one for the corporate parent and another for the minority investor.

Use of "double leverage" also raises another set of issues if it is consistently applied. Policy questions arise concerning the rate of return associated with a corporate parent that are unrelated to the utility subsidiary. That is to say, if a formerly strong corporate parent encounters difficulty, would the regulator be willing to increase the utility's rate of return to accommodate changes in parent company risks.

Q. Are there other specific issues associated with the application of "double leverage" that are sometimes overlooked?

A. With a holding company corporate structure, the return on equity must be attractive to the corporate parent just like it must be to individual investors. "Double leverage" would provide a serious disincentive in the context of limited financial resources that must be allocated to each subsidiary.

The most obvious error of "double leverage" involves the imposition of the parent company's cost of capital on the subsidiary's retained earnings account. There is no parent company debt that was issued for the expressed purpose of financing the retained earnings of the subsidiary. Retained earnings arise from the net income of the utility subsidiary that is not paid out as a dividend. This situation applies directly to TAWC, where AG witness Dr. Brown erroneously failed to give a full equity return on the Company's retained earnings account.

Another issue sometimes overlooked, relates to the equity of the subsidiary that existed prior to the holding company affiliation. While I am aware of the long historical relationship between American Water and TAWC, certainly the financial transactions of RWE that pre-date the acquisition of American Water are irrelevant to the rate of return issue in this case. That is to say, debt issues by RWE that occurred prior to the September 16, 2001 announced acquisition of American Water cannot be rationally incorporated into the Company's rate of return. Hence, the debt listed on Exhibit CAPD-SB 1 page 3 that was issued prior to September 16, 2001 should be excluded from the calculations.

Further, the capitalization of RWE is reflective of the various businesses in which it operates. I do not find that the electric, gas, environmental services, mining, printing systems, and engineering service businesses of RWE that operate in a number of

areas globally are particularly relevant to the rate of return for TAWC. Moreover, differences in financial reporting and the type economic regulation, where it exists, for RWE's international operations provide an inappropriate focus to the rate of return for TAWC in this case. The identity of corporate parent is immaterial to the rate of return for TAWC.

Q. Are TAWC's proposed capital structure ratios reasonable for the purpose of this proceeding?

A. Yes. The Company's actual capital structure ratios are prudent and do not represent an abuse of management discretion. Indeed, they contain no more equity (i.e., are no more costly to customers) than the 56.36% equity ratio indicated for AG witness Dr. Brown's twelve company water group, or the 48.8% common equity ratio for my Water Group. Moreover, the Company's proposed 42.19% common equity ratio conforms with the debt leverage expected by the credit rating agencies.

Q. What evidence has Dr. Brown provided that led him to use the "double leverage" approach?

A. Dr. Brown's evidence seems to rest upon his belief that the dividend payouts of TAWC warrant "double leverage." Except for the year 1999, the dividend payouts for TAWC fall within the range expected for an independent water company whose stock is held directly by investors (i.e., their stock is traded and hence dividend payments cannot be manipulated for an extended period). The dividend payment in the year 1999 was atypical for the Company for reasons explained by Mr. Miller, the Company's Vice President and Treasurer.

However, even in the situation where dividend payments may temporarily exceed earnings, this situation provides no reason to abandon the utility's actual capital structure. Indeed, dividend payouts exceeded earnings for BIW Limited (formerly Birmingham Utilities) in the years 2002 and 2000; for California Water Service in 2001; and for Middlesex Water in 2000. As such, the focus on aberrational dividend payouts provides no valid reason for applying the "double leverage" approach to TAWC in this case.

Q. In his analysis of RWE, Dr. Brown cites some unusual capital structure ratios. Please comment.

A. Dr. Brown cites to an unusually low equity ratio for RWE. He arrives at his perceived debt and equity ratios by attempting to analyze the RWE financial statements that are prepared in accordance with International Accounting Standards ("IAS"). In reaching his conclusion that RWE is highly leveraged, Dr. Brown equates the "provisions" shown on the RWE balance sheet as debt. This represents a misinterpretation of the "provisions" account. RWE includes in the "provision" account its pension obligations, its nuclear decommissioning costs, mine reclamation costs, and other items. The "provisions" are accounted on RWE's balance sheet in this manner because they are not separately funded. This situation is distinct from the treatment provided for these items in the United States, where trust funds are established with third-parties for these obligations and those funds earn a return. Just as the trust funds for pensions and nuclear decommissioning would not be included in the rate of return calculation for domestic utilities, "provisions" are also not viewed as a direct debt equivalent for RWE. Further, there is no significance to the carrying charges on the RWE "provisions" that would

warrant debt treatment for these items. The carrying charges merely recognize that obligations will arise in the future (i.e., the settlement value) and must be discounted to the balance sheet date in order to properly report these amounts. There are no lenders that are actually paid the carrying charges. That is to say, "provisions" do not necessarily possess debt characteristics because they have no maturity date, there are no lenders involved, and no debt service payments are made for these obligations.

Q. Dr. Brown also leaves the impression that after his analysis of RWE's balance sheet, "RWE is considered to be in difficulty." Is this a proper interpretation of RWE's financial condition?

A. No. First, analysts focus on the market value of RWE's assets when assessing the value of parent company. Dr. Brown has given undue emphasis to the book value of the RWE's liabilities. In certain respects, RWE has prudently depreciated the book value of its assets and prudently provided "provisions" described above. This is appropriate accounting under IAS and should not be used as an excuse to penalize TAWC's rate of return. For these reasons, a detailed review of the liability side of RWE's balance sheet could lead to a mis-assessment of the parent company's financial condition -- apparently the conclusion reached by Dr. Brown.

Indeed, the credit quality ratings of RWE do not support the notion that it is "in difficulty." The credit quality rating of RWE is A1 by Moody's Investors Services, Inc. and A+ by Standard & Poor's Corporation. These credit quality ratings provide a sign of a financial strength.

Q. If the Authority were to consider the "double leverage" approach proposed by AG witness Brown, what adjustments should be employed?

A. The cost of equity developed by Dr. Brown cannot be utilized directly in his "double leverage" calculation because the degree of financial risk associated with the market-determined cost rate for his twelve company proxy group is different from the common equity ratio in the "double leverage." That is to say, application of "double leverage" increases risk and must be accounted for. As shown on Exhibit CAPD-SB 13, the equity ratio of his proxy group is 56.36%, yet the "double leveraged" equity ratio is just 40.00% for TAWC. Hence, an adjustment to the cost of equity is required to reflect the higher risk of the 40.00% "double leveraged" equity ratio, versus the lower risk of the 56.36% equity ratio that is known to investors.

Using the Modigliani and Miller theories that were discussed in my direct testimony, Dr. Brown's proposed DCF result would be 8.14% for an unleveraged firm with 100% equity. That result is shown below:

$$ku = ke - (((ku - i)\ 1\text{-}t)\ D/E)$$

$$8.14\% = 9.21\% - (((8.14\% - 6.00\%)\ .65)\ 43.64\%/56.36\%)$$

where ku = cost of equity for an all-equity firm, ke = market determined cost of equity, i = cost of debt, and E = common equity ratio. The formula shown above takes no position on the propriety of Dr. Brown's 9.21% cost of equity.

Having determined the cost of equity for a firm with 100% equity, I then calculated the rate of return on common equity using the "double leveraged" capital structure proposed by Dr. Brown. This provides:

$$ke = ku + (((ku - i)\ 1\text{-}t)\ D/E) + (ku - d)\ P/E$$

$$10.30\% = 8.14\% + (((8.14\% - 6.00\%)\ .65)\ 58.40\%/40.00\%) + (8.14\% - 5.00\%)\ 1.80\%/40.00\%$$

In this case, it is necessary to recognize that the additional financial risk associated with Dr. Brown's "double leverage" approach adds 1.09% (10.30% - 9.21%) to the cost of equity. With the 10.30% cost of equity that accounts for the higher financial risk associated with the "double leveraged" capital structure, the overall rate of return would be 7.90%. This is shown on page 1 of Schedule 7 of Exhibit PRM-4.

Q. Are there other problems associated with Dr. Brown's application of "double leverage"?

A. Yes. There are two additional problems. First, he is using a hypothetical capital structure derived from his twelve company proxy group as a proxy for TAWC's parent company. Second, he assigned a 6% cost for parent company debt that is not related to the 43.64% debt ratio taken from his twelve company proxy group.

Dr. Brown is wrong to use the proxy group's 43.64% debt and 56.36% equity in any way except to directly calculate the rate of return in this case. That is to say, if a hypothetical capital structure should be considered by the Authority in setting the Company's rate of return, then these ratios should be used directly to set the rate of return. This is because investors have knowledge of these ratios when they price the debt and equity securities of these companies, and hence are accepted by the capital markets.

As to the cost of debt, Dr. Brown cannot use the 6% rate developed from the RWE data and assign it to the debt ratio for the twelve company proxy group. The correct procedure would be to synchronize the cost of debt from the twelve company proxy group with its debt ratio. While I have not made that calculation for the twelve company proxy group used by Dr. Brown, the result for my six company water group is

6.30%, which is skewed downward by the extensive use of tax exempt debt by some companies in the group.

COMPARABLE COMPANIES

Q. Has Dr. Brown employed a proxy group of companies to determine the Company's cost of equity?

A. Yes. Dr. Brown and I have used proxy groups of companies to measure the cost of equity for TAWC. Dr. Brown utilized the same six companies that I employed, but supplemented the group with six more non-comparable and relatively obscure water companies. For example, Dr. Brown included Consolidated Water Company that operates outside the U.S., with its service territory in the Cayman Islands, Belize, and the Bahamas. It is unclear to me how a water company operating in the Caribbean and South America is comparable to Tennessee-American. In addition, Southwest Water has substantial non-regulated operations that would disqualify it from consideration in this case. Further, BIW (parent company of Birmingham Utilities), Pennichuck Corp. (recently a takeover target, but now the subject of a potential municipal acquisition after a voter referendum), and York Water are less well known water companies.

Q. Dr. Brown challenges your gas utilities for measuring the cost of equity. Please respond.

A. The market evidence taken from my Gas Group provides valid additional evidence of the cost of equity in this proceeding. Due to the small number of water companies that are available for analysis, a second proxy group is warranted. The similarity of business risk makes the Gas Group suitable for a water utility's cost of equity. Finally, the credit quality of the Gas Group is similar to the Water Group. The Gas Group has a majority

of its earnings from regulated subsidiaries. As to the geographic screening criteria, it was objectivity applied to obtain gas companies that have similar operating characteristics, such as sources of gas supply.

DATA INPUTS

Q. Throughout Dr. Brown's testimony, he repeatedly makes reference to "standard practice" in the financial industry. Will you respond to his statements?

A. On no less than eight occasions, Dr. Brown makes repeated reference to "standard practice." Dr. Brown has not articulated what he means by "standard practice." Hence, it is left to the reader of his testimony to wonder what he means by "standard practice" and to determine if it is being followed.

Q. How do you interpret Dr. Brown's testimony on that point?

A. I interpret Dr. Brown's concept of "standard practices" to equate with the skill level necessary to access data from the internet. That is to say, if Dr. Brown can obtain a collection of similar data from a variety of internet sources, then that is "standard practice."

Q. Is this presumed definition of "standard practice" well accepted?

A. No. Dr. Brown is well off the mark in this regard. Two examples prove my point. First, I will address the issue of adjusted and unadjusted betas. Dr. Brown assumed that because he can access multiple internet web pages that provide unadjusted betas, that this represents "standard practice" in the financial community. His assertion is incorrect. This is shown by the fact that Merrill Lynch adjusts its beta in the manner described in Schedule 4 of Exhibit PRM-4. This is the same procedure used by Value Line. Merrill Lynch is the largest retail stockbroker in the United States and is a major investment

banker. I would suggest that Merrill Lynch, which publishes adjusted betas, is much more representative of the mainstream financial practice. On the other hand, Dr. Brown has not shown where Yahoo and Lycos fits within the financial community. That is not to say that Dr. Brown's other sources such as Thomson and Standard & Poor's are not reputable sources of investment information, but we do not know if Dr. Brown is reporting duplicate information from the same data source. That is to say, we do not know if the betas for American States Water or AGL Resources reported on Exhibit CAPD-SB 8 are exactly the same calculation obtained from separate internet web sites (e.g., Yahoo, Lycos and S&P). The use of Value Line adjusted betas do not violate "standard practice" because Merrill Lynch's betas are also adjusted.

Second, Value Line is one of the most widely available sources of investment information used by investors. Its basic service covers over 1,700 companies operating in over 90 different businesses. As such, the breadth of its coverage makes it an attractive source of investment advice. The publication has nearly 100,000 paid subscribers and it can be obtained free-of-charge at most public and collegiate libraries. Hence, its influence on investors is broad-based. In a testimonial to Value Line by one of America's most famous and well-respected investors, Warren Buffet indicated that Value Line delivered "incredible value" and was "enormously efficient," and he commented, "I don't know of any other system that's as good." Moreover, the well-known Professor of Finance at the University of Chicago Graduate School of Business, Fischer Black, has stated:

> "It appears that most investment management organizations would improve their performance if they fired all but one of their security analysts and then provided the remaining analyst with the Value Line service."

Further, Value Line has been frequently recognized as an investor-influencing source of information because it has often been relied upon in regulatory proceedings as a representation of investor expectations. For example, other regulatory agencies have used Value Line extensively in rate cases. Therefore, it is important to consider all elements that influence investor expectations and Value Line must be one of those sources.

DISCOUNTED CASH FLOW

Q. Do you have specific concerns regarding the DCF applied by Dr. Brown?

A. In order for an analyst to properly apply the DCF method, he/she must be sensitive to a particular company's capital needs, risk profile, and credit quality considerations. Failure to consider these important factors will be unfair to the utility and will lead to a higher future cost of capital (both debt and equity). This is because the cost of capital, like other items of revenues, expenses and investment, must be reflective of the conditions that will prevail during the effective period of the proposed rates. If the DCF approach cannot cope with general capital market fundamentals, then either the assumptions underlying the DCF method are incomplete or the approach is not being properly implemented. The fallacy of the DCF model as applied by Dr. Brown is shown by individual results which provide figures that cannot realistically represent a fair rate of return on common equity. The distribution of the Dr. Brown's DCF returns (see Exhibit CAPD-SB 13) are:

	Number	Percent
Less than 8.00%	6	50%
8.00% - 10.00%	2	17%
10.00% and over	4	33%

One-half of Dr. Brown's DCF results provide returns less than 8%. Moreover, a DCF calculation that shows a 4.22%, or 4.30% return cannot possibly conform with investor expectations in the context of alternative investment opportunities. The cost of equity cannot be less than the cost of debt, which Dr. Brown proposes for American States Water and Connecticut Water Service. He also proposes a cost of equity that is approximately equal to the cost of debt for California Water Service (6.34%), Middlesex (6.30%), SJW Corp. (6.70%), and York Water (6.01%). The cost of equity must exceed this yield on corporate debt by a meaningful margin. It is obvious, the Dr. Brown's DCF returns are not useful for this case.

Q. To conform with typical public utility ratesetting practice, should the DCF return calculated by Dr. Brown be modified?

A. Yes. To make the DCF return conform with typical public utility ratesetting practice, the inputs must: (i) utilize a representative price, (ii) reflect a dividend that is prospective in nature, and (iii) employ a growth rate that is reflective of investor expectations.

Q. Do Dr. Brown's DCF calculations conform with these precepts?

A. As to item (i) listed above, there is some indication that the dividend yield used by Dr. Brown, which was taken from the internet, maybe a spot yield. Indeed, if it was based on a spot (i.e., one day) price, then it does not conform with usual regulatory practice, and it should be revised. While not specifying the date(s) of the stock prices used in his

yield calculation, I will utilize his dividend yields for the purpose of my rebuttal testimony, being mindful that the proper application would use an average, such as six-months.

As to item (ii), Dr. Brown has failed to follow conventional regulatory practice that requires the dividend yield be adjusted by the formula: *D/P (1 + .5g)*, or some other means. This is a widely accepted adjustment in the context of historical dividends amounts in the yield calculation. This adjustment is required because it recognizes that utilities do not pay dividends on a continuous basis, and that the discrete form of the DCF model is required to reflect investors' pricing of utility stocks.

As to item (iii), Dr. Brown has employed an uncommon measure of growth. First, he has used historical data exclusively, which violates both the specification of the model and the way in which investors' price common stocks. Second, he used dividends per share when he should have used earnings per share for reasons described below.

Q. As to the DCF growth component, what financial variables should be given greatest weight when assessing investor expectations?

A. It must be remembered that according to the theory of the constant growth form of the DCF, future earnings per share, dividends per share, book value per share, and price per share will all appreciate at the same constant rate absent any change in dividend payout and price-earnings multiple. Indeed, the evidence shows that these steady-state (i.e., constant growth) conditions represent unrealistic assumptions of investor expectations. With declining dividend payout ratios, earnings per share and price appreciation (i.e., the capital gains yield, or growth component of the DCF) will be at a higher rate than dividend growth in the future for the water companies. This is shown by the forecasts by

Value Line that indicate that dividend payout ratios for the water companies are forecast to decline significantly in the next several years:

Year	Payout
2003	75.6%
2004	65.1%
2006-08	53.9%

With the forecast trend of declining payout ratios, the use of dividend growth is particularly inappropriate for DCF purposes.

Q. Are there other reasons that earnings growth should be emphasized?

A. Yes. Earnings per share are the primary determinant of investor expectations concerning their total returns in the stock market. This is because the capital gains yield (i.e., price appreciation) will track earnings growth with a constant price earnings multiple (a key assumption of the DCF model). It is important to recognize that analysts' forecasts significantly influence investor growth expectations (see page E-12 of my direct testimony). Moreover, it is instructive to note that Professor Myron Gordon, the foremost proponent of the DCF model in rate cases and the individual whose name is most commonly associated with the DCF model, has determined that the best measure of growth in the DCF model is analysts' forecasted earnings per share growth (see Schedule 5 of Exhibit PRM-4). Hence, to follow Professor Gordon's findings, earnings per share forecasts must be given primary weight.

Q. Have you corrected Dr. Brown's DCF calculations?

A. Yes. For this purpose, I have employed Dr. Brown's raw dividend yield, and I have corrected for errors (ii) and (iii) listed above.

As to issue (iii), it is important to consider all elements that influence investor expectations." As demonstrated earlier, Value Line has a broad-based following among

investors, and as such Value Line forecasts cannot be ignored when assessing investor expectations in the context of DCF. Therefore, Value Line forecasts must be incorporated into a DCF analysis to avoid a misspecification of the cost of equity that would occur if Value Line forecasts were ignored. To do otherwise, it would be the equivalent of repudiating the investors' assessment of these companies that are reflected in the prices that have been used to calculate the cost of equity. In addition, First Call should be used because it is from a data source favored by Dr. Brown.

In addition, Zacks is a well regarded source of analysts' forecasts. Finally as to the Multex source of earning forecasts, Barron's rated MultexInvestor as one of the best Websites in its annual rankings. Indeed, MultexInvestor was listed as the best Website in the category of company research/reports. As such, the Multex source cannot be ignored if an objective analysis of the cost of equity is the goal.

Q. What DCF return is indicated from your corrections?

A. The DCF return becomes 9.86% as shown on Schedule 6 of Exhibit PRM-4. However, the 9.86% cost of equity cannot be applied to the capital structure that reflects "double leverage" equity ratio, because that equity ratio is 40.00%, rather than 56.36% known to investors.

Using the Modigliani and Miller theories discussed earlier, DCF result would provide an 8.57% return for an unleveraged firm, as shown below.

$$ku = ke - (((ku - i)\ 1\text{-}t)\ D/E)$$

$$8.57\% = 9.86\% - (((8.57\% - 6.00\%)\ .65)\ 43.64\%/56.36\%)$$

Having determined the cost of equity for a firm with 100% equity, I then calculated the rate of return on common equity using the "double leveraged" capital structure proposal by Dr. Brown. This provides:

ke = ku + (((ku - i) 1-t) D/E) + (ku - d) P/E

11.15% = 8.57% + (((8.57% - 6.00%) .65) 58.40%/40.00%) + (8.57% - 5.00%) 1.80%/40.00%

In this case, the higher financial risk associated with "double leverage" adds 1.29% (11.15% - 9.86%) to the cost of common equity. The 11.15% cost of equity accounts for the changes in financial risk that is associated with the "double leveraged" capitals structure. The resulting overall rate of return would be 8.24%, as shown on page 2 of Schedule 7 of Exhibit PRM-4.

CHATTANOOGA FIRE SERVICE

Q. Have you reviewed Dr. Brown's testimony concerning the issue of fire service now being provided to the City of Chattanooga?

A. Yes.

Q. Does his position in this regard affect the Company's risk and its required rate of return?

A. Yes. To my knowledge, a reduction in the Company's revenue requirements for non-compensatory service is without precedent in traditional utility ratesetting. It also increases the Company's business risk. Schedule 8 of Exhibit PRM-4 computes the effect of the fire service revenues from Chattanooga on the Company's overall revenues. Losing this stable, non-usage sensitive revenues increases the variability of the Company's revenues from .0931 to .0947. With more variable revenues without these Chattanooga fire service revenues, the Company's business risk is higher. This impacts

the Company's overall rate of return, because it is revenue related. Modest recognition of this higher business rate would be worth at least 0.10% in the overall rate of return.

Q. Does this conclude your prepared rebuttal testimony?

A. Yes.

Exhibit PRM-4

TENNESSEE-AMERICAN WATER COMPANY

Financial Exhibit

to Accompany

the Direct Testimony

of

Paul R. Moul, Managing Consultant
P. Moul & Associates

Concerning

Cost of Equity

Infrastructure costs in the Water Utility Industry will rise dramatically over the coming 20 years. Consequently, larger companies are acquiring smaller ones in an effort to achieve economies of scale.

Stocks in the Water Utility Industry are ranked near the middle of the *Value Line* universe. Nevertheless, conservative investors can find appealing choices here due to favorable Safety ranks and healthy dividend payouts.

INDUSTRY TIMELINESS: 47 (of 98)

Industry Consolidation

Infrastructure costs in the water utility industry will likely soar over the next two decades. Water utility companies must constantly repair and upgrade their existing water/wastewater systems in order to comply with increasingly stringent rules issued by the Environment Protection Agency (EPA) and local regulators. Many of the facilities and pipes that transport water were put in place over 100 years ago. The costs of replacing these systems is considerably higher now than they were in the past, even adjusting for inflation. Too, the ongoing depletion of nearby sources of water compels many of the utilities to obtain water from more-distant, more-expensive sources. Water is difficult and costly to transport because it is heavy and incompressible. Nevertheless, utilities must continue to keep pace with the rising demand for drinking water from growing residential and industrial customers. Recent estimates are that it will cost hundreds of billions of dollars to replace and upgrade failing water infrastructures over the next 20 years. This amounts to more than the entire current assets of the water industry in the United States. Much of these costs will likely be financed by federal spending and higher water rates. Nonetheless, water utilities are going to have to ante up much greater capital investments over the coming years.

The costs of staying in compliance with drinking water laws are especially onerous for smaller regional companies because these companies have fewer customers over which to spread their costs. Small and mid-sized water utilities tend to welcome takeover offers from larger, better-capitalized companies so that they can utilize the bigger firm's superior resources. For instance, the EPA's new rules on the allowable levels of arsenic in drinking water (10 parts per billion by January, 2006) is compelling some smaller utilities to merge with larger ones in an effort to remain in compliance with the new standards. By purchasing these smaller entities, large utilities seek to achieve economies of scale. Also, a bigger company gains greater geographic diversity that can reduce its susceptibility to unfavorable weather patterns and potentially burdensome local regulators. For example, the regulatory climate in California has been extremely costly for utilities in the past few years, so companies have been actively looking for acquisition targets outside of the state.

Recent Regulatory Issues

Budget deficits at the federal, state, and local levels ought to hurt water utilities. Lawmakers will probably resist committing scarce public funds towards major infrastructure projects. This is especially frustrating for water companies since it comes at a time when they are dishing out funds to improve security and protect their water-distribution systems. We expect the industry to lobby for grants, changes in the tax code, and government loans. Also, there is a new bill in the U.S. House of Representatives that would make compliance with federal drinking water standards a defense in lawsuits involving contaminants covered by such standards. If enacted into law, this rule could reduce water companies' legal expenses since it would make it much harder for customers to successfully sue for contaminated water.

SDWA Regulations

The Safe Drinking Water Act (SDWA) of 1974 (amended in 1996) authorizes the EPA to work with state and local governments to periodically test for impurities in drinking water. The EPA mandates the acceptable level of certain contaminants per a specified amount of water. Water utilities routinely spend large portions of their annual capital budgets on efforts to remain in compliance with SDWA guidelines. These companies must also comply with the 1972 Clean Water Act, and numerous other state and local laws.

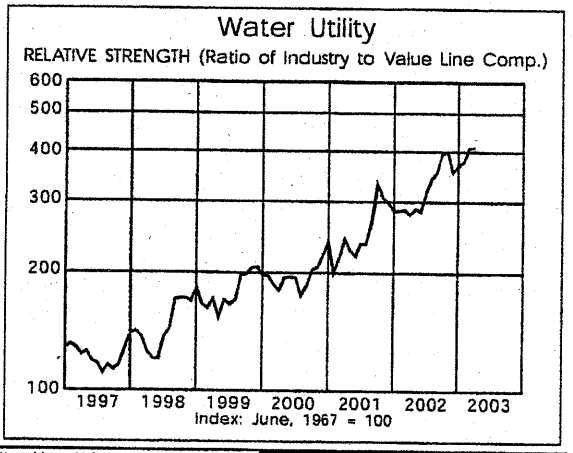
Investment Advice

The water utility stocks in this review are unlikely to outperform the year-ahead market. Nonetheless, they offer above-average Safety ranks, attractive dividend yields, and decent risk-adjusted total-return potential.

Joseph Espaillat

Composite Statistics: Water Utility Industry

1999	2000	2001	2002	2003	2004		06-08
637.2	704.3	751.8	794.4	*835*	*880*	Revenues ($mill)	*1090*
72.4	90.9	95.4	106.6	*110*	*130*	Net Profit ($mill)	*180*
40.0%	41.2%	40.2%	38.8%	*39.0%*	*39.5%*	Income Tax Rate	*40.0%*
--	--	--	--	*Nil*	*.5%*	AFUDC % to Net Profit	*.5%*
51.1%	50.3%	52.4%	53.9%	*53.0%*	*51.5%*	Long-Term Debt Ratio	*51.0%*
48.3%	49.3%	47.2%	45.9%	*46.5%*	*48.5%*	Common Equity Ratio	*49.0%*
1444.7	1661.0	1840.7	1973.6	*2200*	*2380*	Total Capital ($mill)	*2900*
2100.3	2342.5	2532.3	2751.1	*2990*	*3180*	Net Plant ($mill)	*3850*
7.4%	7.0%	6.8%	7.0%	*6.5%*	*7.0%*	Return on Total Cap'l	*7.5%*
11.5%	10.7%	10.6%	11.2%	*10.0%*	*10.5%*	Return on Shr. Equity	*12.0%*
11.5%	10.8%	10.7%	11.2%	*10.0%*	*11.0%*	Return on Com Equity	*12.0%*
3.8%	3.6%	3.3%	3.9%	*3.0%*	*4.0%*	Retained to Com Eq	*5.5%*
68%	67%	69%	66%	*75%*	*65%*	All Div'ds to Net Prof	*54%*
19.5	18.6	22.6	21.5			Avg Ann'l P/E Ratio	*13.5*
1.11	1.21	1.16	1.17	*Bold figures are Value Line estimates*		Relative P/E Ratio	*.90*
3.5%	3.6%	3.1%	3.1%			Avg Ann'l Div'd Yield	*3.0%*



PUR
UTILITY REGULATORY NEWS

Since 1934

PUBLIC UTILITIES REPORTS, INC. Letter # 3595 November 29, 2002

THE UTILITY REPORTER SPECIALIZING IN STATE COMMISSION RULINGS

NATURAL GAS RATES

PSC Rejects Gas Choice Risk Adjustment

The Michigan Public Service Commission has authorized Consumers Energy Co. to increase rates for natural gas local distribution service by $55.728 million. While setting the LDC's allowance for return on common equity (ROE) at 11.4%, the PSC rejected claims by the LDC that the results of standard financial models should be adjusted upward to account for increased risk associated with a move to customer choice in the Michigan gas sales market. Commissioner Robert B. Nelson pointed out in a dissenting opinion, however, that while the majority had reduced the LDC's ROE request, it also had allowed the company to increase the level of common equity in its capital structure thereby increasing its overall cost of capital award. Commissioner Nelson noted that the majority opinion permits Consumers to count as part of its ratemaking capital structure $150 million in equity that was transferred to the utility by CMS Energy Corp., its corporate parent, one day prior to the deadline for submitting evidence in the rate proceeding. Consumers failed to show that the "last minute equity infusion actually produced the result intended—to maintain and increase Consumers' credit rating by improving its equity ratio," according to Commissioner Nelson. He also said that the utility had provided no assurance that the equity (See page 2)

TELECOMMUNICATIONS LEC COMPETITION

Illinois Report Highlights Progress

An annual report on telecommunications markets in Illinois conducted by the state Commerce Commission indicates that competition for retail customers in the basic local exchange telephone market continued to grow by modest amounts during 2001. Despite statistics showing that incumbent carriers control most of the market share in most parts of the state, the commission remains optimistic that the competitive market will continue to develop. According to the commission, several fundamental statistics support such a conclusion: (1) 47 incumbent local exchange carriers and 35 competitive carriers reported that they provided basic local exchange service in Illinois as of Dec. 31, 2001; (2) competitive carriers provided approximately 16% of the 9 million local exchange lines in service at year-end 2001; and (3) competitive carrier market share continued to grow from previous periods with an overall increase of 2% between the end of June 2001 and the end of the year. The commission also acknowledged, however, that the market statistics also reveal that incumbent carriers retain a (See page 2)

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PUR Incorporated

PUR Utility Regulatory News

Natural Gas Rates (Continued from page 1)

infusion will remain with the utility long enough to produce a benefit to ratepayers.

Consumers had asked for a ROE of no less than 12.25% to account for increased risk in the natural gas industry attributable to deregulation and recent gas price volatility. The company also said that the increased risk was reflected in low investment grade ratings assigned to the company's debt by two major rating agencies. A Consumers cost of equity expert also testified that the recent mediocre performance of gas distribution company stocks is directly attributable to inadequate returns on equity approved by regulators. He concluded that increased ROE awards are necessary to attract capital to the gas market given the increased risks and the growth in investment choices due to globalization and privatization. Witnesses called by other parties' including consumer representatives and the state Attorney General, argued that the 12.25% ROE suggested by the company was out of line with external trends in the capital markets such as the numerous interest rate cuts by the Federal Reserve Board, and that risk related concerns were "self-made problems" associated with the company's questionable financial activities.

The PSC said that the company had incorrectly compared the requirements of its investors with those of investors in unregulated non-utility industries. A regulated utility is entitled to a return sufficient to assure confidence in the financial integrity of the regulated enterprise, the PSC said. It added that it was not persuaded that the advent of customer choice had increased the risk of the gas distribution business conducted by Consumers. In addition the utility failed to update its financial models to reflect the numerous interest rate reductions, the entry of the U.S. economy into a recession, and the negative effects of the terrorist attacks on September 11. 2001. *Re Consumers Energy Co., Case No. U-13000, Nov. 7, 2002 (Mich.P.S.C.).* ■

Telecommunications LEC Competition (Continued from page 1)

higher degree of market penetration than seen historically in other formerly competitive markets. It said that after the opening of the long distance telephone market, AT&T's market share dropped from over 90% at the time of the dominant carrier's divestiture in 1984, to less than 75% in 1988. It also admitted that competitive local carrier performance had reached a comparable level of penetration only in the state's most attractive market segment, the Chicago business market.

The report also notes that full facilities-based competition has not yet occurred to any significant degree outside of the Chicago service areas. This statistic reflects the economic reality that high-volume, low cost customers in urban areas, particularly urban business districts, are more attractive to new market entrants than either rural or residential customers, according to the commission. Market statistics clearly show that competitive carriers serve a higher percentage of business customers than residential users. The report indicates that approximately 61% of incumbent carrier retail lines were provided to residential customers. In contrast 55% of the competitive carrier lines were sold to business customers, the commission reported. It also noted that the lowest density service areas showed very little competitive activity. In areas where population densities range from 32 to 76 people per square mile, competitive carriers provide less than 1% of the local service lines. By contrast, the Chicago service area has a population density of nearly 1000 people per square mile and accounts for 87% of the lines provided by competitive carriers statewide, according to the commission report. In addition the competitive carriers rely heavily on the incumbent carriers to provide local service through wholesale purchase of local loops and network services. In Chicago, the area with the largest (See page 6)

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UTILITY REGULATORY NEWS

ANNUAL SURVEY OF ELECTRIC AND GAS UTILITIES

AUTHORIZED RATE OF RETURN ON COMMON EQUITY

Jurisdiction and Company Name	Type of Service (Electric or Gas)	Case, Docket, or Decision No.	Application Date	Order Date	Test-year End Date	Increase [Decrease] Requested ($Million)	Increase [Decrease] Granted ($Million)	Rate of Return on Common Equity	
								Previously Authorized Rate (%)	Newly Authorized Rate (%)
ALABAMA									
Alabama Power Co.	Electric	18117/18416	9/6/01	10/1/01	7/31/01	57.874	57.874	13.75	13.75[1]
Alabama Power Co.	Electric	18117/18416	3/5/02	4/1/02	1/31/02	54.931	54.931	13.75	13.75[1]
Mobile Gas Service Corp.	Gas	28101 *213 PUR4th 204*	5/31/01	10/3/01	3/31/01	9.183	7.827	13.60	13.60[2]
Mobile Gas Service Corp.	Gas	28101 *218 PUR4th 344*	5/31/01	6/10/02	3/31/01	[3]	[3]	13.60	13.60[3]
ARIZONA									
Southwest Gas Co.	Gas	64172 *213 PUR4th 53*	5/5/00	10/30/01	12/31/99	37	21	10.75[4]	11.00[5]
Xcel Energy-Black Mountain Gas Co.	Gas	64727	3/28/01	4/17/02	12/31/00	.25	.15	10.75	9.85
ARKANSAS									
Entergy Arkansas, Inc.	Electric	98-114-U	5/1/01	9/25/01	12/31/00	NA[6]	NA[6]	11.00	11.14
Entergy Arkansas, Inc.	Electric	98-114-U	5/22/02	6/24/02	12/31/01	NA[6]	NA[6]	11.14	11.00
CONNECTICUT									
Yankee Gas Services Co.	Gas	01-05-19 *215 PUR4th 185*	7/24/01	1/30/02	9/30/00	29.20	[4]	11.15	11.00[7]
FLORIDA									
Florida Power Corp.	Electric	000824-EI	7/7/02	5/14/02	12/31/02	NA[9]	NA[9]	12.00	—
Florida Power & Light	Electric	001148-EI	NA	4/11/02	12/31/02	NA[9]	NA[9]	11.00	—
Gulf Power Co.	Electric	010949-EI *218 PUR4th 205*	9/10/01	6/10/02	5/31/03	69.90	53.20	11.50	12.00[8]
GEORGIA									
Atlanta Gas Light Co.	Gas	14311-U	8/24/01	4/29/02	4/30/03	[42.089][12]	[10.00]	11.00	11.00[12]
Georgia Power Co.	Electric	14000-U	6/29/01	12/20/01	12/31/02	102.678	[117.722]	11.00[10]	12.50[11]
Savannah Electric & Power Co.	Electric	14618-U	11/30/01	5/30/02	12/31/02	23.363	7.877	15.00[13]	12.00
HAWAII									
Citizens Communications Co. dba The Gas Co.	Gas	19386	12/28/00	5/31/02	12/31/01	8.90	5.5	11.20	11.50
ILLINOIS									
Ameren Corp./Central Illinois Public Service Co.	Electric[14]	00-0802 *214 PUR4th 437*	12/15/00	12/11/01	12/31/99	NA[15]	NA[16]	NA	11.35
Ameren Corp./Union Electric Co.	Electric[14]	00-0802 *214 PUR4th 437*	12/15/00	12/11/01	12/31/99	NA[15]	NA[16]	NA	11.35
Commonwealth Edison Co.	Electric[14]	01-0423 *216 PUR4th 91*	6/1/01	4/1/02	12/31/01	NA[17]	NA[18]	NA	11.72
MidAmerican Energy Co.	Gas	01-0696	10/19/01	9/11/02	12/31/00	3.226	2.227	11.06	11.20

(See page 4)

Jurisdiction and Company Name	Type of Service (Electric or Gas)	Case, Docket, or Decision No.	Application Date	Order Date	Test-year End Date	Increase [Decrease] Requested ($Million)	Increase [Decrease] Granted ($Million)	Rate of Return on Common Equity	
								Previously Authorized Rate (%)	Newly Authorized Rate (%)
IOWA									
MidAmerican Energy	Electric	RPU-01-03[19]	3/14/01	12/21/01	12/31/00	NA	NA[20]	12.00	12.00[21]
MidAmerican Energy	Electric	RPU-01-09[22] *218 PUR4th 325*	11/01	5/29/02	NA	NA	NA	12.00	12.23[23]
KENTUCKY									
Union Light Heat & Power Co.	Gas	2001-092	3/27/01	1/31/02	9/30/00	7.3	2.70	11.50	11.00
LOUISIANA									
Cleco Power, LLC	Electric	U-21496E	12/14/01	NA[24]	9/30/01	NA	NA	12.25	12.25
MASSACHUSETTS									
Berkshire Gas Co.	Gas	D.T.E. 01-56 *215 PUR4th 361*	6/17/01	1/31/02	12/31/00	4.6	2.268[25]	NA	10.5
MICHIGAN									
Wisconsin Electric Power Co.	Electric	U-12725	11/14/00[26]	9/16/02	12/31/00	3.74	3.183	11.00	11.00
MISSOURI									
Citizens Electric Corp.	Electric	ER-2002-217	11/1/01	6/18/02	12/01	6.50	6.2	NA	*
The Empire District Electric Co.	Electric	ER-2001-299	11/3/00	9/20/01	12/00	41.40	36.7	NA	*
Union Electric Co. dba AmerenUE	Electric	EC-2002-1	7/2/01	7/25/02	6/30/01	[213][27]	[110][28]	12.61	*
UtiliCorp United, Inc., MPS Division	Electric	ER-2001-672	6/8/01	2/21/02	12/00	43.90	[4.2]	NA	*
MISSISSIPPI									
Entergy Mississippi, Inc.	Electric	93-UA-301	3/14/02	5/7/02	12/31/01	2.80	2.00[29]	9.98	10.07
NEVADA									
Nevada Power Co.	Electric	01-10001 *216 PUR4th 457*	10/1/01	3/29/02	5/31/01	23	[41][30]	12.50	10.10
Sierra Pacific Power Co.	Electric	01-11030 *218 PUR4th 1*	11/30/01	5/28/02	7/31/01	16	[15.8][31]	11.25	10.17
Southwest Gas Corp.[32]	Gas	01-7023	7/13/01	12/1/01	2/28/01	7.60	5.9	11.55[36]	10.21[34]
Southwest Gas Corp.[33]	Gas	01-7023	7/13/01	12/1/01	2/28/01	21.70	13.5	11.55[36]	10.64[36]
NEW YORK									
Central Hudson Gas & Electric Corp.	Electric	00-E-1273	8/1/00	10/25/01	12/31/99	14.10	[2.0]	10.60	10.30[35]
Central Hudson Gas & Electric Corp.	Gas	00-G-1274	8/1/00	10/25/01	12/31/99	3.60	0	10.00	10.30[35]
NORTH DAKOTA									
Montana-Dakota Utilities Co.	Electric	PU-399-01-186 *217 PUR4th 347*	9/7/01	4/24/02	12/31/02	36	[4.3]	12.75	11.80
OHIO									
Cincinnati Gas & Electric Co.	Gas	01-1228-GA-AIR	7/31/01	5/30/01	12/31/01	26.00	15.1	11.96	11.77

(See page 5)

DOWN
UP

Jurisdiction and Company Name	Type of Service (Electric or Gas)	Case, Docket, or Decision No.	Application Date	Order Date	Test-year End Date	Increase [Decrease] Requested ($Million)	Increase [Decrease] Granted ($Million)	Rate of Return on Common Equity	
								Previously Authorized Rate (%)	Newly Authorized Rate (%)
RHODE ISLAND									
New England Gas Co.	Gas	3401	11/1/01	6/21/02	9/30/00	7.20	(3.9)	10.70	11.25[37]
SOUTH DAKOTA									
MidAmerican Energy	Gas	NG01-010	9/24/01	2/26/02	12/31/00	3.697	3.105	10.00	11.00
TEXAS									
Central Power & Light Co.	Electric	22352	3/31/00	10/5/01	9/30/99	[38]	[38]	10.90	11.25[39]
Reliant Energy WL&P	Electric	22355	3/31/00	10/4/01	9/30/99	[38]	[38]	11.90	11.25
Sharyland Utilities	Electric	22348	3/31/00	10/4/01	[40]	[38]	[38]	[40]	12.75[40]
Southwestern Electric Power	Electric	22353	3/31/00	10/25/01	9/30/99	[38]	[38]	15.70	11.25
Texas-New Mexico Power	Electric	22349	3/31/00	10/5/01	9/30/99	[38]	[38]	12.20	11.25
TXU Electric	Electric	22350	3/31/00	10/4/01	9/30/99	[38]	[38]	11.35	11.25
West Texas Utilities	Electric	22354	3/31/00	10/25/01	9/30/99	[38]	[38]	11.38	11.25
UTAH									
Utah Power & Light Co.	Electric	01-035-01 *213 PUR4th 225*	1/12/01	9/10/01	NA	141.157[42]	40.573	[41]	11.00[41]
WASHINGTON									
Avista Corp.	Electric	UE-011595	12/3/01	3/4/02	12/21/00	14.70	14.70	12.90	11.16
Puget Sound Energy	Electric	UE-011570	11/26/01	6/20/02	6/30/01	99.40	58.80	10.50	11.00
Puget Sound Energy	Gas	UG-011571	11/26/01	8/28/02	6/30/01	46.50	35.60	10.50	11.00
WEST VIRGINIA									
Hope Gas, Inc.	Gas	01-0330-G-42T	3/6/01	12/3/01	12/31/00	56.70	9.50[43]	NA	*
Mountaineer Gas, Inc.	Gas	01-0011-G-42T	1/4/01	10/30/00	12/31/00	67.10	28.00[44]		
WISCONSIN									
Wisconsin Power & Light Co.	[45]	6680-UR-111	8/1/01	9/13/02	12/31/02	131.20	81.60	11.70	12.30
Wisconsin Public Service Corp.	Electric	6690-UR-113 *218 PUR4th 381*	4/12/01	6/21/02	12/31/02	86.80	58.60	12.10	12.30
Wisconsin Public Service Corp.	Gas	669-UR-113 218 PUR4th 381	4/12/01	6/21/02	12/31/02	13.50	10.60	12.10	12.30

How the Survey Was Conducted

This year's survey covers cost of equity capital determinations by state public utility commissions (PUCs) during the period October 1, 2001 through September 31, 2002. Survey methodology remains similar to past years—requests for information on the results of recent rate proceedings were sent to both regulators and utility financial officials. In addition, direct examination of the commission rate orders, when available, provides additional information. The traditional cost-of-service rate case remains as the most obvious source of information on how utility regulators view the issue of shareholder earnings requirements. Nevertheless, performance-based rate plans, periodic earnings reviews, and special proceedings to determine revenue requirements for restructured electric "delivery-only" utility operations also contain findings about the appropriate ROE for utilities and are reported herein. Explanatory notes accompany most entries, and citations are provided for orders published in *Public Utilities Reports, Fourth Series (PUR4th).* ■

(See page 6)

ENDNOTES (Continued from page 6)

*. Approved settlement agreement. ROE not specified.
1. Utility operates under a rate stabilization and equalization (RSE) plan, i.e., an alternative rate-making mechanism that provides for periodic automatic adjustments to maintain ROE within a specified range. ROE figure shown is midpoint of approved range.
2. Rate case settlement. Parties agree to rates to allow the same ROE as approved in the utility's prior rate case decided in 1991.
3. Alabama PSC authorized gas utility to operate under RSE *(see note 1)* with RSE midpoint set at the same rate as allowed in prior rate case *(see note 2)*.
4. ROE derived from settlement agreement rate award.
5. Capital costs are determined based on a hypothetical capital structure containing a 40 percent equity component.
6. Earnings review case. Overearnings to be placed in a Transition Cost Account to mitigate industry-restructuring stranded cost. Fund recently allocated to defray ratepayer impact of extraordinary ice storm expenses.
7. Authorized ROE reflects results of discounted cash flow analysis as adjusted by eight basis points for risk associated with the LDC's lack of a weather normalization clause.
8. ROE allowance includes a 25 basic point reward for superior service.
9. Both Florida Power & Light and Florida Power Corp. have revenue sharing plans in effect.
10. Product of a 3-year Alternative Rate Plan with base rates calculated using a Return on Equity of 11.00 percent and an earnings range of 10.00 percent to 12.50 percent, with GPC retaining 1/3 of any earnings above 12.50 percent.
11. Product of a 3-year Alternative Rate Plan with base rates calculated using a Return on Equity of 12.50 percent and an earnings range of 10.00 percent to 12.95 percent, with GPC retaining 1/3 of any earnings above 12.95 percent.
12. Case brought by PUC Adversary Staff in price earnings review proceeding. Product of a 3-year Alternative Rate Plan with base rates calculated using a Return on Equity of 11 percent and an earnings range of 10 percent to 12 percent, with AGLC retaining one quarter of any earnings above 12 percent.
13. ROE approved in 1985.
14. Proceeding to determine revenue requirement for delivery-only services provided under Illinois electric industry restructuring plan.
15. Ameren CIPS requested $187.632 million total revenue requirement. AmerenUE requested $34.24 million.
16. Ameren CIPS revenue requirement at $169.147 million. AmerenUE total revenue requirement set at $31.762 million.
17. Utility initially requested total annual revenue requirement of $1.787 billion.
18. Commission approves annual total revenue requirement of $1.57 billion.
19. Application for rate review by Iowa Consumer Advocate. Case consolidated with separate application on 6/11/01 by the company *docketed as RPU-01-5*.
20. Settlement incorporating significant portion of rate agreement approved by commission 6/27/97 in *docket RPU-96-8*.
21. ROE maintained at level approved as part of prior settlement *(see note above)*.
22. Order determining rate-making principles to be applied to construction of new electric facilities. ROE for investment in specific plant shall be 12.23 percent for so long as the plant remains a board-regulated utility asset.
23. ROE set at high end of risk premium analysis using a 12-month bond yield average.
24. Proceeding involved scheduled review of utility earnings.
25. Order approving 10-year price cap plan for LDC. Increase shown is for "cast-off" rates established by commission.
26. Initial opinion remanded for further hearings. PSC found that record did not provide adequate basis for revenue requirement findings in view of utility's failure to reflect the transfer of its transmission assets to American Transmission Co., a regional independent electric transmission entity.
27. Staff-filed excess earnings complaint case.
28. Rate reduction to take effect over three-year period.
29. Annual earnings review under formula rate plan.
30. Base rate disallowance. PUC also denied recovery of $437 million in purchased power costs incurred during regional power crisis.
31. Base rate disallowance. PUC also denied recovery of $55.8 million in purchased power costs.
32. Northern operations territory.
33. Southern operations territory.
34. Approved settlement agreement lists no ROE finding. Figure shown is an estimate provided by company.
35. Rate plan earnings sharing mechanism applied as follows: Earnings up to 11.30 percent retained entirely by shareholders. Earnings between 11.30 percent and 14 percent shared equally with ratepayers. Earnings above 14 percent deferred for benefit of customers.
36. PSC advocacy staff filed complaint against utility alleging excess revenue collection of $9.155 million per year.
37. Figure shown represents bottom of earnings sharing range. Sharing begins at 11.25 percent with 50/50 split of earnings between 11.25 percent and 12.25 percent. Ratepayers benefit from 75 percent of earnings above 12.25 percent.
38. Filings pursuant to state restructuring law. Proceedings concerned with unbundling of transmission and distribution assets and services.
39. Commission approved generic ROE of 11.25 percent for transmission and distribution operations by order dated 12/18/00 in *Docket No. 22344*.
40. Sharyland utilities began operations in February of 2000, and used forecasted test-year data, because of its start-up nature, Sharyland was excluded from the generic docket referred to in note 2.
41. PSC grants interim increase of $70 million in February, but permits delay of refunds of excess collections by later order citing financial concerns and cash flow constraints. *See Re Utah Power & Light Co., 213 PUR4th 249 (2001)*.
42. Figure shown contained in approved revenue requirement stipulation. Return requirement based on hypothetical capital structure of 47.6 percent common equity, 49.2 percent debt and 3.2 percent preferred stock.
43. Includes both base rate and cost of gas adjustment.
44. Base rate approximately $4.8 million of total figure shown.
45. Combined electric gas and water rate case. ■

DOW ▼

TELECOMMUNICATIONS LEC COMPETITION (Continued from page 2)

percentage of facilities-based competition, competitive carriers still rely on incumbent facilities for 93% of their lines.

Nevertheless, the commission said that there is some reason to be optimistic that the pace of competition will increase in the near future. It explained that recent additions to the state telecommunications restructuring law add new market opening provisions to the regulatory format. In addition, the recent decision by the U.S. Supreme Court in the case of *Verizon Communications, Inc. v. FCC, 535 U.S. 467 (2002)* affirms a number of competitive market provisions of the federal Telecommunications Act of 1996 that have been stalled for years, the commission said. ■

▲ UP

Tennessee-American Water Company
Overall Rate of Return
at March 31, 2004

Type of Capital	Ratios	Cost Rate	Weighted Cost Rate
Short-Term Debt	6.2%	3.50%	0.22%
Long-Term Debt	20.8%	7.62%	1.59%
Parent Debt	31.4%	6.00%	1.89%
Total Debt	58.4%		3.70%
Preferred Stock	1.6%	5.01%	0.08%
Parent Common Equity	40.0%	9.21%	3.68%
Total	100.0%		7.46%

Indicated levels of fixed charge coverage assuming that the Company could actually achieve its overall cost of capital:

Pre-tax coverage of interest expense based upon a 38.90% composite federal and state income tax rate (9.85% ÷ 3.70%)	2.66 x
Post-tax coverage of interest expense (7.46% ÷ 3.70%)	2.02 x
Overall coverage of interest expense and preferred stock dividends (7.46% ÷ 3.78%)	1.97 x

**Merrill Lynch
Pierce
Fenner & Smith Inc.**

JANUARY 1980

Security Risk-Evaluation Service

DESCRIPTION OF MERRILL LYNCH BETA COEFFICIENTS

This booklet explains the terms used and describes the concepts and computational procedures followed in calculating the Merrill Lynch betas.

BASIC PROCEDURE

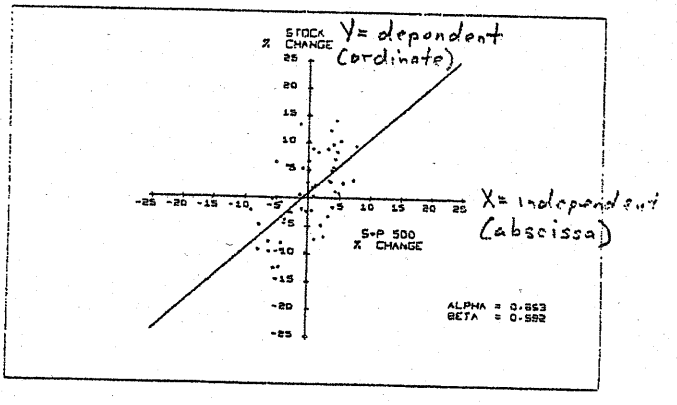
Merrill Lynch computes betas on individual securities by means of regression analysis. The analysis provides a description of the relation between monthly price returns on an individual stock and monthly price returns on the Standard & Poor's 500 Stock Index. The ch t shows a scatter diagram of returns on an individual security plotted against returns on the S & P 500. Each point in the chart represents the realized price return on the stock and on the S & P 500 Index for a single month.

Because of the comovement between stock returns and returns on the S & P 500, the points usually form a pattern that is best described by a straight line. Regression analysis determines which straight line best approximates the observed points. In mathematical terms, that line is the one for which the sum of the squared distances between the points and the line is smallest, i.e., a "least squares" regression estimate.

TERMINOLOGY

The beta coefficient of a stock is the slope of the regression line. The beta represents the average incremental percentage change in return (positive or negative) on the stock in relation to an incremental 1% change in return (positive or negative) on the S & P 500. Securities with higher betas are more sensitive to market fluctuations because, on average, they gain (or lose) more when the S & P 500 rises (or falls). The alpha coefficient is the intercept of the line; i.e. the height of the line at the point where the S & P 500 return is zero (see chart).

Because the price of a stock is affected by events peculiar to the company as well as by the market fluctuations indicated by the S & P 500, the actual points are not on the line, but are scattered around it. Residual standard deviation is a summary measure of the distances from the points to the line. Statisticians often refer to it as



the "standard error of estimate." Residual standard deviation is important because it measures a security's specific (or non-market) risk. The greater a particular stock's residual standard deviation, the greater the effect on its price of events specific to the company's operations.

Using past results to determine a straight line (to estimate an alpha and beta) is subject to statistical error. For example, if returns on a stock were observed for an extended time and separate regression analyses were made for each of several sub-periods, different values of alpha and beta would almost certainly be computed from each regression, even if the market sensitivity and probability distribution of specific returns were unchanged. The values would differ because realized specific returns are independent of the market and would therefore have varying effects on the results of the regression. The standard error of estimate on alpha or beta is a measure of possible divergence of the estimate from the true value.

The r^2 statistic represents the percentage of price fluctuations of a security explained by market fluctuations. Mathematically, r^2 is the ratio of the variance of explained returns to the variance of total return for the stock.

STABILITY OF BETA AND ALPHA

To be useful, the beta measurements must indicate the future market sensitivities of individual securities. Among researchers who have studied the stability of beta coefficients are Marshal Blume, Lawrence Fisher, Michael Jensen, Robert Levy, and William Sharpe. Most of their research involved measuring and comparing betas on individual stocks and on randomly selected portfolios during pairs of non-overlapping time periods. Although a relation was found between betas for individual stocks during successive time periods (stocks with high betas in one period tended to have high betas in the next), betas for many stocks appeared to differ significantly from one period to the next. There are at least two explanations for the variations. Any estimated beta is affected by statistical or sampling error; therefore, observed differences between pairs of estimated betas, both subject to error, can be larger than the differences between actual betas. Changes do occur in the actual values of some stock betas and further intensify observed differences.

When portfolios were analyzed, the results were considerably more satisfying. Because specific returns on a group of stocks tend to balance one another and the law of large numbers takes hold, statistical errors in computing a portfolio beta are significantly smaller. If betas for some stocks in a portfolio actually change, stocks with increased betas are balanced by others with decreased betas. Consequently, portfolio betas computed for one period closely resemble the betas computed for the succeeding period. The research on portfolios supports the contention that a beta computed on a portfolio has excellent predictive value. Primary studies supporting that result include those of Black-Jensen-Scholes, Sharpe and Cooper, and others.

The alpha coefficient is an indicator of how well a stock has performed, after the market effect has been eliminated, during the previous five years. Testing during non-overlapping periods has shown that ex ante alphas are not indicative of ex post alphas. If alphas were stable, investors would choose to hold only stocks with high alphas and, by doing so, would bid up their prices and thus eliminate any stability. It is precisely that action in the marketplace that causes alphas to have an expected value of zero.

Even though alphas have no predictive value for individual stocks, that does not preclude their usefulness in measuring past performances of managed portfolios, if they are based on actual portfolio returns. Correctly measured portfolio alphas are a useful estimate of the manager's ability in selecting securities.

METHOD

There are several alternative procedures for calculating betas, and several alternative data sources are available. A primary consideration in choosing the Merrill Lynch method was the extent to which given procedures had been tested both in the academic and financial communities.

Merrill Lynch chose standard-regression estimates because no empirical evidence has shown other methods to be superior statistically. In standard regression, recent returns carry no more weight than earlier returns. Because betas for many stocks probably change over time, methods that favor recent information have intuitive appeal. Some methods "smooth" data to allocate more

weight to current information. Exponential smoothing is one method that weights new data more heavily, but applies the same smoothing constant to all data. A method based on Kalman Filtering adjusts the smoothing constant continuously to alter the weight given to new data. The weight is based on a series of tests designed to determine how significantly new information differs from older data. Selecting the "best" smoothing constant is difficult in either case; and, in the case of betas, the selection process is complicated by the need to use different constants for different stocks. If the wrong smoothing constant is used, the procedure may phase out early information too quickly, or give too much weight to obsolete data.

Tests conducted by Dr. Lawrence Fisher of the University of Chicago showed that certain exponential-smoothing constants produced betas for some stocks that were slightly more reliable predictors than those attained by standard regression. The improvement, however, was not great enough statistically to warrant the use of that method. Research on Kalman Filtering looks promising, but experiments have been restricted to stocks on which monthly data on returns is available for significantly more than five years. Kalman Filtering is described in an article written by Dr. Michael Kantor of Merrill Lynch in the January-February 1971 edition of the *Financial Analysts Journal.* Those and other procedures are currently being tested by Merrill Lynch. If subsequent testing shows such new methods to be superior, they will be incorporated into the Merrill Lynch service.

Monthly differencing intervals were chosen for the Merrill Lynch service. That method provides a large number of observations during a five-year period, and it is the method that has been most thoroughly tested. Merrill Lynch funded the development of the original data base—the rate of return files of the Center for Research in Security Prices of the University of Chicago—on which much of the testing of the beta concept was performed. The files contain monthly returns on NYSE-listed stocks from 1926 through 1966. (An update to include data through the present time is almost complete.)

Annual and quarterly returns were rejected because too few observations were available. Daily returns are appealing because they permit the largest number of observations to be used within a given time. Nonetheless, use of daily returns could create serious problems—in particular, the so-called "Fisher effect." Daily closing prices are not established at precisely the same time of day (the close of trading), but are the prices at which each stock was last traded during each day. If trading in a particular stock is light, the closing price may reflect an early trade that was unaffected by changes in the market level later in the day. Because daily percentage changes are usually small, an apparently slight market change later in the trading day might be significant. Further research is under way to determine whether serious bias does exist in daily returns. If the bias is less severe than is now supposed, or if methods can be developed to overcome the biases, daily returns data might replace the monthly information now in use.

Similar problems pertain to weekly data, although the biases differ as does the extent of testing. In general, weekly data in machine-readable form are available for a significant number of stocks only since 1962. Therefore, truly effective empirical evaluations of weekly data may not be made for some time.

In the calculations, returns on the stocks and on the S & P 500 are represented by percentage price changes, excluding dividends. Studies have shown that betas based on simple price returns are almost identical to those based on total returns (prices and dividends). A study by Sharpe and Cooper at Stanford University showed that the r^2 on regressions of total-return betas against price-return betas is above .99. Because dividends are usually stable, it can also be shown that the two methods yield statistically, as well as empirically, an almost identical beta. Although monthly price returns are available within a few days after the end of each month, dividends information is not so readily available, and collection of total-returns data would be considerably delayed. Merrill Lynch believes that the immediate availability of returns excluding dividends outweights the alleged superiority of returns including dividends.

In recent months certain adjustments to the betas have been suggested, and some would appear to be beneficial. The adjustments allow for recognition of the phenomenon called regression bias. Because of random statistical error, the betas of many stocks with high observed betas really have been overestimated, and few have been underestimated. For example, if all stocks had betas between 0 and 2, any stock with an

observed beta of two could only be biased upward. All stocks that appeared to have a beta of two would either really have a beta of two or a lower beta with an upward measurement error. Therefore, the best predicted beta for the over-all group of stocks with an observed beta of two would be somewhat less than two. The same principle holds in actual beta calculations. Generally, a group of stocks with a high observed beta includes more issues whose beta values are overestimated than underestimated so that the future beta of this group of stocks will be lower than was observed. The reverse applies to stocks with low observed betas. Consequently, expected future betas on all stocks tend to move in the direction of one from their calculated values.

In an article in the March 1971 issue of the *Journal of Finance,* Marshal Blume offered one approach to the problems of regression bias: he computed betas on a group of stocks during two consecutive non-overlapping time intervals and regressed first-period betas against later betas. When the resulting regression equation was applied to the earlier betas, the best estimators, by definition, of subsequent betas were produced. If the relation between ex ante and ex post betas is constant, applying such regression equations to current betas should improve the predictive value of those betas. Testing supports that contention.

An alternative adjustment makes use of an empirical Bayesian approach to determine the amount of measurement error in the population of betas. One makes an a priori assumption that all betas are equal to one. Using the statistical error information (standard error of beta) provided by the regression, it is possible to gauge the over-all accuracy of the betas vis-a-vis the prior estimates. Adjusted betas are obtained by taking an appropriately weighted average of the unadjusted and the a priori estimates of beta. Because the degree of adjustment depends on the estimated reliability of a priori assumptions, no change is made in the betas if the a priori estimates prove to be useless.

Statistical theory indicates that under certain conditions those modifications can never result in worse predictions that those indicated by the unadjusted betas. Testing has shown that the method is as effective as that suggested by Blume in improving the predictability of betas. That approach does not rely on the assumption that the ex post and ex ante relation between betas in one set of time periods will be the same as those in the preceding set, because no inputs except the regressions used to compute the raw betas are required. The adjustment based on the Bayes approach has been implemented into the Merrill Lynch beta service.

A priori assumptions need not be so simple as that presented above. One could, for example, assume that only betas of stocks trading on the same exchange or stocks of companies in the same industry are approximately equal. An advantage of using more sophisticated a priori estimates is that when prior assumptions are more realistic, more effective adjustments are obtained. Further research will examine the feasibility of using more complex priors.

PROJECTIONS OF PORTFOLIO RETURNS

An important function of beta coefficients is to predict future portfolio returns on the basis of projected market or S & P 500 returns. According to the Sharpe-Lintner capital-asset-pricing model, total portfolio return (price + dividend returns) is given by: $Y-R = B\ (X-R)$

where:

Y = Return of fund
R = Risk-free rate
B = Beta of fund
X = Market return

Thus, the effect of a beta applies only to returns above or below the risk-free rate. For example, a portfolio with a beta of 1.5 should return 12% in a year in which the market is up by 10% and the risk-free rate is 6%. The excess return of the market (the difference between actual market return and the risk-free rate) of 4% has been multiplied by the beta of 1.5. The portfolio would then have an excess return of 6%, for a total return of 12%. In a period when the market return is 4% and the risk-free rate is 6%, the 1.5 beta portfolio should return 3% (the excess return of -2% multiplied by 1.5 gives the portfolio an excess of -3%, for a total return of 3%).

Because theory has indicated and testing has shown that the use of price returns instead of total returns has almost no effect on calculated betas, there is no problem in applying those betas directly to the capital-asset-pricing model. All calculations are based on betas that have been adjusted for regression bias, unless otherwise specified by the user.

Because total return is the sum of price return and dividend return for both the portfolio and S & P 500 one can estimate long-term price returns on the portfolio on the basis of projected price returns on the S & P 500 in the following manner:

1. To obtain the projected total return on the S & P 500, add its expected dividend return to the projected price returns.

2. Apply the capital-asset-pricing model (using projected total return on the S & P 500) to estimate total portfolio return.

3. Subtract the expected portfolio dividend return from expected return to obtain the expected price return on the portfolio.

Rewriting the model (where the subscripts p and d refer to price and dividend returns)

$$Y_p + Y_d - R = B\,(X_p + X_d - R)$$

In the Merrill Lynch projections, the risk-free return is assumed to be 5% a year, unless otherwise specified by the user. Dividend return on the S & P 500 is assumed to be the current expected yield for that Index. The portfolio's annual dividend rate is supplied by the user. If the projected time period is other than one year, both the annual dividend and risk-free rates are adjusted appropriately. For users not supplying dividend and horizon information, Merrill Lynch provides short-term projections based on total return for the market. The projections are for total portfolio return and incorporate no risk-free rate assumption.

DIVERSIFICATION

Both portfolio beta and portfolio specific return are merely dollar-weighted averages of the corresponding values of the component stocks. Because specific returns for a group of individual stocks tend to cancel one another, most of the specific risk in a portfolio is diversified away. That is not true for market risk, because all stocks are affected by market fluctuations. Consequently, market risk is the dominant source of risk for portfolios.

Because beta coefficients for portfolios are only useful if they aid in predicting future results, the Merrill Lynch service provides a statistic that gauges the effect of the various holdings on the total portfolio and estimates the level of portfolio diversification. The greater the diversification, the more closely the portfolio should approximate the risk-adjusted projections implied by its estimated beta.

It can be shown that the specific risk (variance in specific returns) is given by

$$\Sigma P_i^2 \sigma_i^2$$

where:

P_i = Proportion of portfolio in stock
σ_i = Residual standard deviation of stock

Mathematically, variance of specific returns in a portfolio is reduced because of squaring numbers less than 1. The measure of diversification is given by

$$D = \frac{\sigma^2}{\Sigma P_i^2 \sigma_i^2}$$

where: σ = Residual standard deviation of a typical stock. D = The number of typical stocks in which one must invest equal numbers of dollars to obtain the same amount of diversification.

If, for example, a portfolio has diversification measure D = 20, diversification is equivalent to an investment of an equal number of dollars in each of 20 typical stocks. That measure allows for the fact that a portfolio with unequal numbers of dollars in each stock is usually not so well diversified as a portfolio with equal sums invested in each of the same securities. The diversification measure also takes into account the fact that portfolios of stocks having large residual standard deviation will be less diversified than are portfolios having stocks with more moderate residual standard deviations.

In the Merrill Lynch service, the stocks that make up the S & P 500 are used to determine the characteristics of "typical" stocks for the purpose of measuring diversification. The diversification measure is described in the article "Risk, Market Sensitivity and Diversification" by Professor William F. Sharpe, published in the January-February 1972 *Financial Analysts Journal.*

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BIBLIOGRAPHY

Black, Fisher; Jensen, Michael; Scholes, Myron. "The Capital Asset Pricing Model: Some Empirical Results," *Studies in the Theory of Capital Markets,* Ed. Michael Jensen, New York, Praeger Publications, 1972.

Blume, Marshal E., II. "The Assessment of Portfolio Performance: An Application of Portfolio Theory." Doctoral dissertation, University of Chicago, March 1968.

——. "On the Assessment of Risk," *Journal of Finance,* March 1971.

Brealey, Richard A. "The Impact of the Market on British Share Prices," *The Investment Analyst,* October 1969.

Fama, Eugene F. "The Behavior of Stock-Market Prices," *Journal of Business,* January 1965, pp. 34-105.

Jensen, Michael C. "Risk, the Pricing of Capital Assets, and the Evaluation of Investment Portfolios," *Journal of Business,* April 1969, pp. 167-247.

Kantor, Michael. "Market Sensitivities," *Financial Analysts Journal,* January-February 1971.

Levy, Robert A. "On the Short-Term Stationarity of Beta Coefficients," *Financial Analysts Journal,* November-December 1971

Markowitz, Harry. *Portfolio Selection: Efficient Diversification of Investments,* John Wiley & Sons, Inc., New York 1959.

Sharpe, William F. "A Simplified Model for Portfolio Analysis," *Management Science,* January 1963, pp. 277-93.

——. "Risk, Market Sensitivity and Diversification," *Financial Analysts Journal,* February 1972.

——. "Mean Absolute Deviation Characteristic Lines for Securities and Portfolios," *Management Science,* October 1971.

Treynor, Jack L.; Priest, William W., Jr.; Fisher, Lawrence; and Higgins, Catherine A. "Using Portfolio Composition to Estimate Risk," *Financial Analysts Journal,* September-October 1968, pp.93-100.

Choice among methods of estimating share yield

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

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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

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

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

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

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 t market portfolio.

There is an important difference between tl CAPM model of share yield and the DCF model re resented by Equation (1). The latter is merely an strument for measuring share yield: There is nothi in the DCF model that explains the variation in yi among shares. The CAPM, on the other hand, i theory on why and how yield varies among shar but one must go outside of the theory to estimate t variables on the right-hand side of Equation (4). Giv rules for estimating the variables, EHPR and BET empirical work then provides a joint test of the the and the estimating rules, such as we are carrying c here.[6]

The CAPM nonetheless has been used to timate share yield in testimony before regulatory co missions by assigning numbers to each of t quantities on the right-hand side of Equation (4). I INTR, a long-term bond yield is sometimes used stead of a one-period rate. BETA is estimated by c ventional methods.

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

COMPARATIVE PERFORMANCE

We carried out our empirical work with a sa ple of 75 large electric and gas utility firms an sample of 244 firms that includes 169 industrial fi drawn from the S&P 400. We obtained share y under the four methods for estimating it as of start of the year for the years 1984, 1985, and 19

For the explanatory variables, BETA for e share on each date was obtained by regressing monthly HPRs for the share on the monthly HPRs the S&P 500 over the prior five years. DMI for a sh is its dividend yield less the interest rate on the c month Treasury bill at the start of each year. EGR DGR are the growth rates in earnings and in c dends per share, respectively, over the prior five y as reported on the Value Line Tape. BRG is a weig

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			KDGR		
	1984	1985	1986	1984	1985	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.

REFERENCES

Brennan, M.J. "Taxes, Market Valuation and Corporate Financial Policy." *National Tax Journal*, 23 (1973), pp. 417-427.

Brigham, E., D. Shome, and S. Vinson. "The Risk Premium Approach to Measuring a Utility's Cost of Equity." *Financial Management*, Spring 1985, pp. 33-45.

Fama, E., and J.D. MacBeth. "Risk, Return and Equilibrium: Empirical Tests." *Journal of Political Economy*, 81 (May 1973), pp. 607-636.

Friend. I., R. Westerfield, and M. Granito. "New Evidence on the Capital Asset Pricing Model." *Journal of Finance*, 33 (June 1978), pp. 903-917.

Gordon, M.J. *The Cost of Capital to a Public Utility*. East Lansing, Michigan: Michigan State University, 1974.

Gordon, M.J., and L.I. Gould. "Comparison of the DCF and HPR Measures of the Yield on Common Shares." *Financial Management*, Winter 1984a, pp. 40-47.

——. "The Nominal Yield and Risk Premium on the TSE-300, 1956-1982." *Canadian Journal of Administrative Sciences*, 1 (1984b), pp. 50-60.

——. Testimony Before the Federal Communications Commission in the Matter of American Telephone and Telegraph Company. FCC Docket No. 79-63, April 1980.

Harris, R.S. "Using Analysts' Growth Forecasts to Estimate Shareholder Required Rates of Return." *Financial Management*, Spring 1986, pp. 58-67.

Kolbe, A.L., J.A. Read, and G.R. Hall. *The Cost of Capital: Estimating the Rate of Return for Public Utilities*. Cambridge, MA: MIT Press, 1984.

Morin, R.A. *Utilities' Cost of Capital*. Arlington, VA: Public Utilities Reports, Inc., 1984.

Theil, H. *Applied Economic Forecasting*. Chicago: North Holland, 1966.

Discounted Cash Flow Model (Typical Regulatory Form)
Using Generally Accepted Inputs
With Water Company Group proposed by AG

Water Company	(1) Zacks	(2) First Call	(3) Mkt Guide	(4) VL	(5) Growth Rate (%)	(6) Current Div. Yield (%)	(7) Projected Div. Yield D/P(1+.5g) (%)	(8) DCF Return on Equity (%)
Amer St Water (NYSE:AWR)	4.50%	4.00%	3.00%	6.00%	4.38%	3.42%	3.49%	7.87%
Artesian Resources Corporation (NASDAQ: ARTNA)*	8.00%	8.00%	8.00%	-	8.00%	3.59%	3.73%	11.73%
Birmingham Utilities (AMEX:BIW)*	-	-	-	-	NA	2.60%	NA	NA
California Water Svc (NYSE:CWT)	5.00%	3.00%	3.00%	9.00%	5.00%	5.19%	5.32%	10.32%
Connecticut Water Service, Inc. (NASDAQ:CTWS)	-	NA	-	3.00%	3.00%	3.27%	3.32%	6.32%
Consolidated Water Co. Ltd. (NASDAQ:CWCO)*	10.00%	10.00%	10.00%	-	10.00%	2.92%	3.07%	13.07%
Middlesex Water Company (NASDAQ:MSEX)	7.00%	7.00%	7.00%	7.00%	7.00%	3.80%	3.93%	10.93%
Pennichuck Corporation (NASDAQ:PNNW)*	-	NA	-	-	NA	2.48%	NA	NA
Phila Suburban Cp (NYSE:PSC)	8.42%	9.00%	8.80%	10.00%	9.06%	2.40%	2.51%	11.57%
S J W Cp (AMEX:SJW)	4.00%	NA	-	4.00%	4.00%	2.49%	2.54%	6.54%
Southwest Water Company (NASDAQ:SWWC)*	8.50%	9.00%	9.00%	8.50%	8.75%	1.82%	1.90%	10.65%
York Water Company (NASDAQ:YORW)*	7.00%	7.00%	7.00%	5.30%	6.58%	2.96%	3.06%	9.64%
Average	6.94%	7.13%	6.98%	6.60%	6.58%	3.08%	3.29%	9.86%

Tennessee-American Water Company
Overall Rate of Return
at March 31, 2004

Type of Capital	Ratios	Cost Rate	Weighted Cost Rate
Short-Term Debt	6.2%	3.50%	0.22%
Long-Term Debt	20.8%	7.62%	1.59%
Parent Debt	31.4%	6.00%	1.89%
Total Debt	58.4%		3.70%
Preferred Stock	1.6%	5.01%	0.08%
Parent Common Equity	40.0%	10.30%	4.12%
Total	100.0%		7.90%

Indicated levels of fixed charge coverage assuming that the Company could actually achieve its overall cost of capital:

Pre-tax coverage of interest expense based upon a 38.90% composite federal and state income tax rate
(10.57% ÷ 3.70%) 2.86 x

Post-tax coverage of interest expense
(7.90% ÷ 3.70%) 2.14 x

Overall coverage of interest expense and preferred stock dividends
(7.90% ÷ 3.78%) 2.09 x

Tennessee-American Water Company
Overall Rate of Return
at March 31, 2004

Type of Capital	Ratios	Cost Rate	Weighted Cost Rate
Short-Term Debt	6.2%	3.50%	0.22%
Long-Term Debt	20.8%	7.62%	1.59%
Parent Debt	31.4%	6.00%	1.89%
Total Debt	58.4%		3.70%
Preferred Stock	1.6%	5.01%	0.08%
Parent Common Equity	40.0%	11.15%	4.46%
Total	100.0%		8.24%

Indicated levels of fixed charge coverage assuming that the Company could actually achieve its overall cost of capital:

Pre-tax coverage of interest expense based upon a 38.90% composite federal and state income tax rate (11.13% ÷ 3.70%)	3.01 x
Post-tax coverage of interest expense (8.24% ÷ 3.70%)	2.23 x
Overall coverage of interest expense and preferred stock dividends (8.24% ÷ 3.78%)	2.18 x

Tennessee American Water Company
Revenues by Customer Class

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Residential	9,481,784	10,164,753	10,978,648	11,247,469	11,468,200	11,621,955	11,916,764	12,276,394	12,213,603	12,107,938	11,766,754	11,979,631
Commercial	6,210,830	6,707,114	7,128,429	7,346,551	7,495,507	7,652,702	7,993,861	8,435,256	8,682,007	8,973,153	8,902,901	9,032,869
Industrial	3,190,984	4,022,182	4,283,126	4,551,005	3,990,778	4,010,259	4,113,851	4,134,220	4,085,368	4,313,835	4,040,707	3,570,786
Private Fire	711,866	789,345	799,627	860,368	880,079	915,301	988,298	995,513	1,028,213			
Public Fire plus Chattanooga	971,382	1,070,447	1,100,083	1,174,111	1,188,528	1,231,845	1,315,371	1,328,698	1,339,002	2,444,701	2,444,129	2,444,129
Sale for Resale	364,687	410,586	446,818	361,603	350,107	369,108	534,252	681,396	763,578			
Public Authority and Misc	1,531,681	1,770,896	1,899,880	2,095,537	1,990,071	2,082,240	2,334,413	2,366,476	2,398,333	3,293,415	3,163,968	3,239,632
Other	667,182	899,058	917,039	909,980	924,178	915,927	911,068	990,580	1,069,251	1,047,980	1,098,751	1,045,819
	23,130,396	25,834,381	27,553,650	28,546,624	28,287,448	28,799,337	30,107,878	31,208,533	31,579,355	32,181,022	31,417,210	31,312,866
Chattanooga Public Fire - not billed										364,000	882,123	1,100,000

Average	29,163,225
Std Dev	2,714,748
Coeff Var	0.093088044

Tennessee American Water Company
Revenues by Customer Class

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Residential	9,481,784	10,164,753	10,978,648	11,247,469	11,468,200	11,621,955	11,916,764	12,276,394	12,213,603	12,107,938	11,766,754	11,979,631
Commercial	6,210,830	6,707,114	7,128,429	7,346,551	7,495,507	7,652,702	7,993,861	8,435,256	8,682,007	8,973,153	8,902,901	9,032,869
Industrial	3,190,984	4,022,182	4,283,126	4,551,005	3,990,778	4,010,259	4,113,851	4,134,220	4,085,368	4,313,835	4,040,707	3,570,786
Private Fire	711,866	789,345	799,627	860,368	880,079	915,301	988,298	995,513	1,028,213			
Public Fire - excl. Chattanooga	31,382	100,447	70,083	118,111	108,528	231,845	215,371	228,698	239,002	1,344,701	1,344,129	1,344,129
Sale for Resale	364,687	410,586	446,818	361,603	350,107	369,108	534,252	681,396	763,578			
Public Authority and Misc	1,531,681	1,770,896	1,899,880	2,095,537	1,990,071	2,082,240	2,334,413	2,366,476	2,398,333	3,293,415	3,163,968	3,239,632
Other	667,182	899,058	917,039	909,980	924,178	915,927	911,068	990,580	1,069,251	1,047,980	1,098,751	1,045,819
	22,190,396	24,864,381	26,523,650	27,490,624	27,207,448	27,799,337	29,007,878	30,108,533	30,479,355	31,081,022	30,317,210	30,212,866
Chattanooga Public Fire - billed	940,000	970,000	1,030,000	1,056,000	1,080,000	1,000,000	1,100,000	1,100,000	1,100,000	736,000	217,877	

Average	28,106,892
Std Dev	2,661,542
Coeff Var	0.094693557