R-850152

Trial Staff does accept PECO's footnote 1 (p. 10) which indicates that later portions of the Commission brief asserted that a finding of imprudence was made. Trial Staff submits that the flawed logic of PECO's incorrect procedural recitation of the first Limerick Investigation appellate review does nothing to support the conclusion (p. 11) PECO again strains to reach. At the risk of being repetitious, PECO's continued attempts to equate a finding (of imprudence) with an adjudication simply does not comport with the plain language of Section 316.

Finally, there is sufficient evidence to undermine PECO's "lack of due process" argument. See PECO Answer, footnote 2, pp. 11-12. The quoted portion (p. 7) of the Commission Order, October 10, 1980, initiating the Limerick Investigation gives notice of the possibility of an impact on PECO's rate base. The admission in PECO's Reply Brief, quoted above (See ¶ 7 above and Appendix 1, p. 116), demonstrates that PECO availed itself of the opportunity to litigate the issue. The Commission then based its finding of imprudency upon the evidence introduced by the parties, particularly PECO's Mr. Paquette. Thus, PECO has already received all of the due process to which it is entitled on the issue of liability for imprudence.[1/] See Cohen v. Pennsylvania Public

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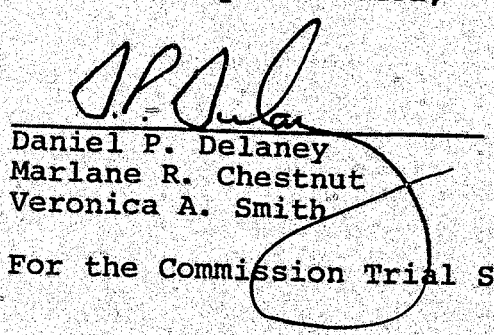
1/ For a succinct statement of due process requirements see Smith v. Pennsylvania Public Utility Commission, 192 Pa. Superior Ct. 424, 429, 162 A.2d 80, 83 (1960).

Utility Commission, 78 Pa. Commonwealth Ct. 545, 554-556, 468 A.2d 1143, 1148-1149 (1983); aff'd. ___Pa. ___, 493 A.2d 653 (1985).

10. Admitted in part and denied in part. Trial Staff admits that the instant proceeding is the first time the parties will face the issue of the inclusion in rate base of the costs associated with Limerick I and Common Plant. Further, Trial Staff admits that PECO is entitled to all reasonable due process rights with respect to that issue. However, as indicated above, Trial Staff denies that this case should present any opportunity to PECO to relitigate the reasonableness of the 1976 and 1978 deferral decisions. The issue of the reasonableness of the deferral decisions was litigated in the 1980 Limerick Investigation wherein PECO received all due process rights to which it was entitled. (See discussion ¶ 9 above). That issue was resolved adversely to PECO and that finding has not been disturbed upon appeal. Relitigation is now foreclosed by the operation of Section 316 of the Public Utility Code. There is no reason to burden the record in this proceeding with any evidence beyond the finding of imprudence set forth by the Commission Order at I-80100341, entered August 27, 1982. To do otherwise would be contrary to the plain language of Section 316.

WHEREFORE, the Trial Staff respectfully requests the Presiding Officer to rule that the Commission's prior finding that the Limerick 1976 and 1978 construction delays were unreasonable and imprudent is prima facie evidence of that finding and conclusive on the parties to this proceeding.

Respectfully submitted,



Daniel P. Delaney
Marlane R. Chestnut
Veronica A. Smith

For the Commission Trial Staff

G-28 North Office Building
Harrisburg, PA 17120
(717) 783-2804

CERTIFICATE OF SERVICE

I hereby certify that I have this day served a true copy of the foregoing document upon parties of record in this proceeding in accordance with the requirement of 52 Pa. Code §1.54.

Dated this 16th day of December, 1985.

Daniel P. Delaney

For Commission Trial Staff

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

COPY

RE: LIMERICK NUCLEAR GENERATING : DOCKET NO. I-80100341
STATION INVESTIGATION : (1980)

REPLY BRIEF OF THE PHILADELPHIA ELECTRIC COMPANY

Before Administrative Law Judge Joseph J. Klovekorn

Robert H. Young
Walter R. Hall, II
Michael G. Nearing
Larry R. Chatzkel
Margaret B. Dardess

Counsel for Philadelphia
Electric Company

NSEL:
rd G. Bauer, Jr., Esq.
President & General Counsel
e A. McKenna, Esq.
stant Counsel
adelphia Electric Company
Market Street
adelphia, PA 19101

AN, LEWIS & BOCKIUS
South Broad Street
The Fidelity Building
adelphia, PA 19109

: February 3, 1982

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Law Bureau

F. Brief of the Trial Staff.

In its Brief, Trial Staff asserts that PECO should be charged with responsibility for various imprudent decisions as respects the Limerick construction schedule made in connection with the schedule extensions in 1976 and 1978. Despite these assertions, however, Trial Staff does not propose that any present penalty be assessed against the Company, but rather requests that the issues which it defines should be reserved and reviewed by the Commission upon Limerick's introduction into rate base.

PECO urges the Commission to reject Trial Staff's various arguments in its Order concluding this proceeding. As noted in the Commission's Order of October 10, 1980, a principal purpose of this investigation has been to examine "the cost of construction delays at Limerick and whether those delays were reasonable". Trial Staff and all other parties to this investigation, including PECO, have had a full opportunity to develop the record upon this issue. PECO believes that it is clear from a review of Trial Staff's Main Brief and that of PECO (pp. 286-308), that Trial Staff has failed to prove any management decision which could properly be characterized as imprudent on applicable legal and regulatory principles as defined in PECO's Brief (at pp. 296-298). Further, the implied threat inherent in Trial Staff's deferral request that

such a penalty be imposed upon completion of the plant obviously imposes a risk to the Company and its investors that increases the costs of plant financing and completion. Accordingly, recognizing that proper notice and a full hearing opportunity has been provided as to Trial Staff's asserted "imprudence issues" and based upon the overwhelming evidence of record as described in PECO's Main Brief, Trial Staff's allegations should be rejected.

In addition to the obvious inaccuracies and unsubstantiated assertions which are the basis of Trial Staff's position as described in PECO's Main Brief, there are several major deficiencies to Trial Staff's arguments which should be noted. First, Trial Staff implicitly assumes, without demonstration, that earlier completion of Limerick (i.e. earlier than the Forecast 5 Schedule) would have been beneficial to ratepayers (T.S.M.B., p. 5). This is a matter of empirical analysis, which would require examining the effect upon PECO's operations and revenue requirements of Limerick completion at Trial Staff's earlier proposed dates and employing best estimates of cost conditions. Trial Staff has not attempted any such analysis, but rather argues on the basis of generalized notions that earlier plant completion would have resulted in a lower plant price tag.

UGI had the notice. I don't believe that you can do that here. The facts are different.

Mr. Delaney argued that Judge Klovekorn had made a finding which, in Mr. Delaney's view, was based on the credibility of the company's witnesses and suggested to Your Honor that Your Honor could not review that finding in this proceeding because, obviously, credibility is a matter in the hearing room.

However, Judge Klovekorn himself expressly stated that he was making no finding and the issue was to be resolved in this case. Thus, certainly Judge Klovekorn did not perceive the point advanced by Mr. Delaney as being a bar to consideration of the issue here.

Your Honor, that is all that I have.

JUDGE MATUSCHAK: Thank you.

We understand the importance of a ruling on this motion as early as possible, so that we are prepared to render an interim decision at this time.

Having reviewed the pleadings filed in connection with Trial Staff's Motion in Limine in this proceeding and having heard oral arguments today, we will rule now on the motion so that the parties, so desiring, may seek timely review by the Commission. Because of the importance of this matter, we will follow our ruling by a Memorandum Opinion more fully discussing the basis of our interim decision.

While some aspects relating to the motion may be of first impression, some overall precedent had been established in the CAPCO investigation at I-79070315 and I-79070317, in which we had presided, involving two jurisdictional electric utilities--together with certain Ohio electric utilities--Duquesne Light Company and Pennsylvania Power Company.

Trial Staff in its motion alleged that the Commission had considered the prudency of Philadelphia Electric Company's construction of the Limerick Station in: Re: Limerick Nuclear Generating Station, I-80100341, 56 Pa. P.U.C. 47. That proceeding was an investigation ordered on October 10, 1980, wherein the Commission had said it had concluded that an investigation should be opened "so that information can be gathered in an orderly and expeditious manner before PECo seeks to include Limerick in its rate base as used and useful property."

Further it said, "We concluded that an independent investigation of Limerick was appropriate so as to prevent the then pending rate investigation from becoming burdened with additional issues which would have had to be decided within the statutory period set forth in Section 1308 of the Public Utility Code.

We note that in that proceeding, 38 days of evidentiary hearings were held and that the matter was

concluded almost two years from its initiation on August 2
1982.

Among the issues considered by the Commission there were the prudency, first, of the initial decision by PECo to begin construction of the Limerick nuclear generating station; two, of the 1974 delay in Limerick's construction schedule wherein PECo postponed the projected in-service dates by two years; third, of the 1976 decision by PECo wherein it further delayed construction and extended the in-service dates of Limerick Nos. 1 and 2 from 1981-'83 to 1983-'85, respectively; and, four, of the 1978 decision by PECo to further delay and reschedule the in-service dates of Limerick from 1983-'85 to 1985-'87, respectively.

It is apparent that the Commission, recognizing that these issues could not be adequately addressed with all the other issues involved in a rate case, when PECo would seek to include Limerick in rate base, as a pragmatic procedure, directed that such issues be determined in an independent proceeding in the nature of a bifurcation or as an ancillary or in-aid aspect of this rate case.

These issues were addressed in the Limerick proceeding in an open and full hearing in which Trial Staff and all the other parties, including PECo, had a full opportunity to develop the record on this issues.

In the Limerick proceeding, the Commission found

that the initial decision of PECo to construct Limerick and the decision to delay the in-service dates of Limerick in 1974 were prudent; and that PECo's decisions in 1976 and 1978 to further delay the in-service dates of Limerick were imprudent or unreasonable.

In its Motion in Limine, Trial Staff requests that we rule that the Commission's prior finding that Limerick 1976 and 1978 construction delays were unreasonable be conclusive on the parties to this proceeding. Trial Staff's reliance for such request on the basis of Section 316 of the Public Utility Code, however, is unfounded.

We will, however, grant Trial Staff's motion on the ground that the Comission's findings at I-80100341 of imprudence in the 1976 and 1978 Limerick construction delays should be incorporated into this rate proceeding in the nature of a bifurcation or as an ancillary or in-aid aspect of this rate case, and that all parties having had an opportunity to develop a record in a full and open hearing in said Limerick investigation, such findings by the Commission are conclusive on the parties in this proceeding.

Likewise, we hereby determine that the same treatment shall be afforded to the Commission's prior findings of fact that the PECo's initial decision to construct Limerick and its 1974 construction delays were prudent when made.

We render the following Interim Order:

It is ordered, first, that the Motion in Limine by Trial Staff that we make a preliminary determination of the nature of the evidence that may be admitted into the record in this rate proceeding at R-850152 is hereby granted.

Two, that the record at I-80100341, insofar as it relates to the decisions of Philadelphia Electric Company to initially construct the Limerick nuclear generating station and to delay construction of Limerick in 1974, 1976 and 1978, are incorporated by reference into the record of this proceeding.

Three, that Trial Staff's motion that we determine that the Commission's prior findings at I-80100341 that Philadelphia Electric Company's decisions in 1976 and 1978 to delay Limerick construction were unreasonable are conclusive upon the parties in this proceeding is hereby granted.

Four, that sua sponte, we further determine that the Commission's prior findings at I-80100341 that Philadelphia Electric Company's decisions initially to construct the Limerick nuclear generating station and to delay the Limerick construction in 1974 were reasonable are likewise conclusive upon the parties in this proceeding.

Five, that the evidence heretofore admitted in this proceeding insofar as it relates to the reasonableness

or unreasonableness of Philadelphia Electric Company's initial decision to construct the Limerick nuclear generating station and its decisions to delay Limerick construction in 1974, 1976 and 1978, is hereby stricken and that further evidence relating thereto shall not be admissible in this proceeding.

We will take a ten-minute recess.

(Recess.)

PENNSYLVANIA
PUBLIC UTILITY COMMISSION
Harrisburg, PA 17120

Public Meeting held October 9, 1980

Commissioners Present:

Susan M. Shanaman, Chairman
Michael Johnson
James H. Cawley
Linda C. Taliaferro

Limerick Nuclear Generating Station Investigation — I-80100341

ORDER

BY THE COMMISSION:

On August 8, 1980, the Office of Consumer Advocate (OCA) filed a petition, docketed at P-80080236, seeking (1) an Order to Show Cause why the continued construction of the Limerick Nuclear Generating Station (Limerick) of Philadelphia Electric Company (PECO) is in the public interest and (2) a Commission investigation into the need for and economy of Limerick. PECO has filed an answer, along with its own petition. It opposes issuance of the Rule to Show Cause and suggests that any investigation of Limerick be consolidated with the current PECO general rate increase proceeding at R-80061225. The OCA has filed an answer to PECO's petition. We conclude that an investigation of certain issues concerning Limerick should be opened.

We are opening this investigation proceeding so that information can be gathered in an orderly and expeditious manner, before PECO seeks to include Limerick in its rate base as used and useful property. This approach will enable us to proceed without the pressures of time associated with rate cases.

We realize, of course, that Limerick is under construction and that it represents a major, and controversial, undertaking by PECO. However, although we agree with the OCA that a Limerick proceeding should be opened, we do not agree that the Rule to Show Cause requested by the OCA is appropriate. We must first proceed to gather facts. We can then reach conclusions and enter whatever orders we deem to be appropriate.

Although the pending PECO rate case at R-80061225 will necessarily deal with Limerick to some degree, we conclude that we should not burden that proceeding with additional issues and that an independent investigation of Limerick should be opened; THEREFORE,

DOCKETED
OCT 15 1980

DOCUMENT FOLDER

Exhibit No. 4

IT IS ORDERED:

1. That the issue we incorporated into the rate proceeding at R-80061225 on August 28, 1980, concerning an estimate of the additional costs occasioned by deferrals of the Limerick construction schedule, be eliminated from that proceeding.

2. That an investigation be, and is hereby, undertaken to determine:

(a) The cost of construction delays at Limerick and whether those delays were reasonable;

(b) The escalation of cost estimates for Limerick and whether those costs for the plant are reasonable; and

(c) The eventual impact of Limerick on PECO's capacity and reserve margins and the reasonableness thereof.

3. That the petition filed by the OCA, and docketed at P-80080236, be denied, except to the extent that it is granted by the opening of this investigation.

4. That Commission staff, Philadelphia Electric Company and the Office of Consumer Advocate are hereby made parties to this investigation proceeding.

5. That copies of this order be served on all parties to the proceeding at R-80061225, Pennsylvania Public Utility Commission v. Philadelphia Electric Company.

6. That the Office of Administrative Law Judge assign this matter to an Administrative Law Judge for prompt hearing and initial decision.

BY THE COMMISSION,

William P. Thierfelder
Secretary

(SEAL)

ORDER ADOPTED: October 9, 1980

ORDER ENTERED: October 10, 1980

MORGAN, LEWIS & BOCKIUS
COUNSELORS AT LAW
123 SOUTH BROAD STREET
PHILADELPHIA, PENNSYLVANIA 19109
TELEPHONE: (215) 875-5000
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September 23, 1982

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SEP 23 1982
Pa. P. U. C.
Law Bureau

G. Ronald Darlington, Esq.
Prothonotary
Commonwealth Court of Pennsylvania
620 South Office Building
Harrisburg, PA 17108

Re: In Re Limerick Nuclear Generating Station Investigation, Pa. P.U.C. Docket No. I-80100341 (Aug. 27, 1982)

Dear Mr. Darlington:

Enclosed for filing with the Commonwealth Court is the original and three copies of Philadelphia Electric Company's Petition for Review of the above-captioned Pennsylvania Public Utility Commission Order. Also enclosed is a check for the required filing fee, the Proof of Service and Notice of Procedure for Intervention forms required by the Court's rules. As set forth in the attached Certificate of Service, I have today served copies of the foregoing document on all parties to the proceeding below, the Commission and the Attorney General of Pennsylvania.

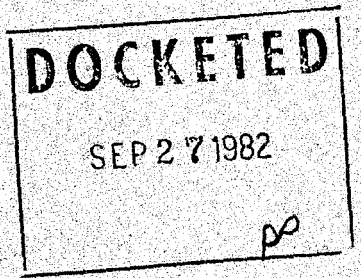
We are filing with the Commission on this same date a Petition for Supersedeas of its Order and are requesting that it act upon said Petition at its next scheduled public meeting of October 1, 1982. We will file with the Court an Application for Supersedeas early next week pursuant to Pa. R.A.P. Rule 1781 and will request appropriate proceedings be held before the Court on this Application late in the week of October 4, 1982.

Please stamp the extra copy of the Petition enclosed for that purpose with the date and time of receipt and return it by return messenger.

Sincerely,

Walter R. Hall II

Walter R. Hall, II
Counsel for Philadelphia
Electric Company



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SEP 27 1982

/jfm
Enclosure(s)

Exhibit No. 5

IN THE

COMMONWEALTH COURT OF PENNSYLVANIA

PHILADELPHIA ELECTRIC COMPANY, :
Petitioner :
: No. 2345
: Commonwealth Court
: Docket 1982
v. :
: RECEIVED
PENNSYLVANIA PUBLIC UTILITY : SEP 23 1982
COMMISSION, : Pa. P. U. C.
Respondent. : Law Bureau

PETITION FOR REVIEW

1. This Court has jurisdiction over this matter by reason of 42 Pa. C.S. §763(a)(1) (direct appeals from government agencies).

2. Petitioner, Philadelphia Electric Company ("PECO"), is a regulated public utility rendering electric, gas and steam service in a service territory of 2,255 square miles with a population of approximately 3.7 million. PECO renders electric service to a total of approximately 1.3 million retail customers in Philadelphia and surrounding territory in Bucks, Chester, Delaware, Montgomery and York Counties. PECO's main office is located at 2301 Market Street, Philadelphia, Pennsylvania (19101).

3. Respondent is the Pennsylvania Public Utility Commission which, under the Pennsylvania Public Utility Code (66 Pa. C.S. §101 et seq.), is empowered to regulate certain activities of PECO related to its utility service operations. Respondent's address is North Office Building, P. O. Box 3265, Harrisburg, Pennsylvania (17120).

DOCKETED
SEP 27 1982

4. The Limerick Nuclear Generating Station is a nuclear powered station for the generation of electricity being constructed by PECO at Limerick in Montgomery County, Pennsylvania. It has an anticipated capability of 2110 megawatts divided equally between Limerick Unit 1 scheduled for completion in 1985 and Limerick Unit 2 at present scheduled for completion in 1987. Construction of the Station began in 1974 after receipt of necessary licenses from the Atomic Energy Commission (i.e. Docket Nos. 50-352 and 50-353), and after approval from Respondent for the siting of various structures at the plant. See Application Docket No. 96108 (1971). Respondent has examined PECO's Limerick construction plans and activities on two occasions prior to the instant proceeding; i.e., in connection with PECO's 1977 and 1979 electric rate applications at Docket Nos. R.I.D. 438 and R-79060865. As of July 31, 1982, approximately $1,007 million had been spent on Limerick 1 (approximately 78% complete), $461 million on Limerick 2 (approximately 30% complete), and $827 million on plant used jointly by the two units (i.e. "common plant").

5. On August 7, 1980, the Pennsylvania Consumer Advocate filed a Petition at Respondent's Docket No. P-80080236 requesting "the Commission to order PECO to show cause why continued construction of the Limerick Nuclear Generating Station is in the public interest" and "to order an investigation into the need for and economy" of the Station. By Order entered October 10, 1980, the Commission denied the request for a Rule to Show Cause, but initiated a fact-finding investigation directed at certain specified issues.

6. Respondent's Investigation was undertaken pursuant to 66 Pa. C.S. §331(a) which provides as follows:

> The Commission may, on its own motion and whenever it may be necessary in the performance of its duties, investigate and examine the condition and management of any public utility or any other person or corporation subject to this part. In conducting the investigation, the Commission may proceed, either with or without a hearing, as it may deem best, but it shall make no order without affording the parties affected thereby a hearing. Any investigation, inquiry or hearing which the Commission has power to undertake or hold shall be conducted pursuant to the provisions of this chapter.

Pursuant to its authority under §331(b), Respondent assigned the matter to one of its Administrative Law Judges as an "on-the-record proceeding" for disposition under 66 Pa. C.S. §§332(g), (h) and 335.

7. Hearing and discovery procedures began December 10, 1980 and concluded on November 13, 1981. Initial and Reply Briefs were submitted in early 1982. On March 26, 1982, Respondent's Administrative Law Judge issued his Initial Decision concluding (at p. 245):

> After reviewing the extensive record in this proceeding, I can come to but one conclusion--that at the present time there is no alternative available that can replace Limerick at a lower cost to the consumer. The record shows that the timely completion of Limerick Units I and II is in the best interest of PECO and its ratepayers. Since the generation produced at Limerick will replace expensive oil-fired generation either produced by the Company itself or purchased from the PJM system, these plants must be brought on line as soon as possible.
>
> It is essential, therefore, that this project be completed as close to the 1985/1987 projected commercial operation dates as possible and as close to the company's projected costs as possible. While it must be recognized that licensing delays outside the control of the company or this Commission could affect these dates, this Commission must assure

itself, and the ratepayers it represents, that completion of this facility will be undertaken as expeditiously as possible and at the lowest possible cost.

Exceptions and Replies to Exceptions to the Initial Decision were filed with Respondent in April 1982. On May 7, 1982, Respondent adopted the "Second Revised Motion of Chairman Susan M. Shanaman" as the substance of its decision. On August 27, 1982, Respondent entered its Opinion and Order more fully setting forth that decision ("August 27 Order").

8. Respondent's decision is in substance as follows:

(a) That completion of Limerick 1 as rapidly as possible consistent with the public safety is in the public interest and within PECO's financial capabilities.

(b) That completion of Limerick 2 in 1987 as proposed by PECO is "not financially feasible" due to the "Commission's inability and unwillingness to provide the necessary revenues to complete both units ... as proposed" and is thus not "in the public interest".

(c) That to ensure the timely completion of Limerick 1 and the "continued maintenance of reliable and safe service to the public", PECO must "inform" the Commission within 120 days which of two defined alternatives it wishes to select; i.e., "the cancellation or suspension of construction at Limerick Unit 2".

(d) That to enforce PECO's selection of one of the two mandated options, the PUC (i) "shall not approve" any new security issues intended in whole or in part to finance construction at Limerick 2 and (ii) shall deny recovery from

ratepayers of Allowance for Funds Used During Construction ("AFUDC") on additional Limerick 2 investment (i.e., investment following entry of its Order) when sought in a future rate proceeding.

(e) That it is "in the public interest" and PECO is directed to pursue "an aggressive conservation program designed to substantially offset the suspension or cancellation of Limerick Unit 2", and is to submit a "conservation program plan" within 120 days of entry of Respondent's Order.

(f) That PECO in its 1976 and 1978 decisions to defer the completion of the Limerick Station "did not exercise judgment sufficient to meet our reasonable man standard" but that rate base or other penalties to be imposed upon the Company on this account cannot be quantified at this time.

9. Respondent's findings, conclusions and proposed enforcement actions are beyond its jurisdiction and/or authority under the Pennsylvania Constitution and the Public Utility Code (66 Pa. C.S. §101 et seq.) as follows:

(a) The Pennsylvania Public Utility Code does not provide for preconstruction approval or certification of utility plant by either Respondent or any other state agency. By seeking to impose a choice upon PECO to either cancel or suspend construction at Limerick 2, Respondent seeks to exercise a certification or approval jurisdiction over PECO's construction activities which is not granted to it by law. In its Order, Respondent states no claim that such a jurisdiction exists.

(b) Respondent has failed to provide an effective hearing process and a reasoned decision upon record evidence as mandated by law. Its Opinion and Order decide matters not properly noticed in its Order initiating its Investigation and not addressed at evidentiary hearings, and upon the basis of asserted facts not of record in the proceeding (See paragraph 12 infra). In addition, it rejects PECO's evidence and positions on virtually all matters of significance addressed in its Opinion and Order, and nearly all recommendations of its Administrative Law Judge, with no reasoned explanation for said rejection.

(c) The Public Utility Code does not confer upon Respondent the jurisdiction to disallow future rate requests not yet made, such as Respondent's determination to "deny recovery of AFUDC ... on any additional investment in Limerick 2 at such time as recovery is sought" or its determination that decisions made by PECO in 1976 and 1978 to defer completion of the Limerick plant were unreasonable and may warrant a future unquantified penalty. In its Order, Respondent fails to assert any statutory basis for such authority.

(d) The Public Utility Code does not confer upon Respondent the authority to "approve" or "not approve" utility security issues to enforce its preferences as to the construction of utility plant or other program alternatives. Code §§1901-1904 provide merely for the "registration" of securities and permit the Respondent to examine financial matters associated with the proposed issuance. Contrary to Respondent's assertion, these Code sections do not provide a "de facto" certification or plant approval jurisdiction.

(e) In its Order, Respondent asserts that its jurisdiction and authority derive principally from Code §§ 501, 1301 and 1501, which empower it to regulate public utilities to assure "just and reasonable" rates and "adequate, efficient, safe and reasonable service and facilities". It is apparently Respondent's theory that continued construction of Limerick 2 endangers present or future "service" or "rates" necessitating and empowering it under Code § 501 to take action to defer or discontinue construction of the plant to prevent this danger. Respondent's interpretation of its authority under Code §§ 501, 1301 and 1501 is an erroneous justification for its jurisdiction in conflict with established Pennsylvania law. Moreover, this asserted basis for Respondent's authority was never noticed, nor was PECO ever granted the opportunity to present argument as to the existence or non-existence of this asserted authority. The record contains no evidence whatsoever to support Respondent's conclusion as to PECO's present or future service or rate levels.

(f) Respondent lacks authority to direct PECO to "pursue an aggressive conservation program", especially as Respondent has failed to define the contents of the program which it directs that PECO pursue. Respondent states in its Order no basis for its asserted authority.

10. Respondent orders PECO to file an election within 120 days either to cancel or defer construction of Limerick 2. However, the August 27 Order renders informed decision-making by PECO an impossibility and increases the financial risk associated with PECO securities as follows:

(a) By directing that PECO must decide whether to cancel or defer construction of Limerick 2 without providing guidance as to whether and to what extent PECO will be permitted to recover from ratepayers the costs associated with these mandated alternatives.

(b) By finding that PECO's 1976 and 1978 decisions deferring Limerick completion did not "meet our reasonable man standard", without explaining what consequences or penalties it will attach to this conclusion. Said penalties may include denial of a return of or a return on a substantial portion of the investment in said plant as proposed in the record.

The failure to decide such issues, which were noticed, addressed in the evidence and fully argued, is an abuse of discretion and imposes upon PECO financial and regulatory risks which may prevent the attraction of capital as needed at reasonable cost. Said arbitrary and capricious action could well necessitate delay in completion of Limerick 1, which Respondent has found should be completed as quickly as possible in the public interest.

11. The August 27 Order is further erroneous and should be set aside because said Order is not supported by substantial evidence, is based upon errors of law and confiscates PECO's property in violation of due process of law as guaranteed by the Constitutions of the United States and of the Commonwealth of Pennsylvania as follows:

(a) Respondent's determination that "the completion of Limerick 2 by 1987 is not financially feasible" is in error and

should be rejected, not only because there is no evidence to support such a finding, but also because it is based upon the erroneous legal theory that Respondent is "unwilling and unable" to approve revenue sufficient to finance completion. If Limerick 2 completion in 1987 is the least cost alternative for both PECO and its ratepayers, as found by Respondent's Administrative Law Judge and not denied by Respondent, then it is an abuse of discretion, arbitrary and capricious and not in the public interest for Respondent to withhold the revenues required for such completion. Moreover, Respondent's approved additional revenues at Docket No. R-811626 of $221.7 million (PECO's 1981 Electric Rate Application, Order entered May 21, 1982), would, in fact, be sufficient to permit the continued construction of both Limerick units, if further rate relief were granted as circumstances required for continued financing.

(b) Respondent's finding that completion of Limerick 2 on PECO's proposed 1987 schedule is not in the public interest is arbitrary, capricious, against the substantial weight of the evidence and is an error of law, being based solely on the unsupported "financial feasibility" theory discussed above. As found by Respondent's Administrative Law Judge and as shown by the evidence of all parties when corrected for obvious errors, completion of both Limerick 1 and 2 is substantially lower in cost and more beneficial to PECO, its ratepayers and shareholders than the alternatives imposed by Respondent; i.e., suspension or cancellation of Limerick 2.

(c) Respondent's "finding" that the 1976 and 1978 deferrals in Limerick completion fail to reflect reasonable management judgment is unsupported by record evidence and is an error of law for the following reasons:

(1) Respondent has made inconsistent determinations - i.e., that a "reasonable man" viewing the conditions and with the knowledge available in 1976 and 1978 would (1) have "compressed" Limerick's construction schedule (i.e. built the plant faster) or (2) would have cancelled the plant. In seeking to refute PECO arguments that decreased load growth or financial condition were proper bases or necessitated deferral decisions, Respondent asserts or implies that Unit 2 cancellation would have been the correct response under its "reasonable man" standard (August 27 Order, p. 16). However, while attempting to refute PECO evidence as to the economic benefits of deferred plant completion as compared to cancellation, Respondent asserts that the construction schedule should have been "compressed". Respondent should not be permitted to have it both ways - a reasonable man based on the specific facts and knowledge available at the time a decision had to be made, could have chosen but one course of action. In its Order, Respondent simply shifts its ground as needed to support its erroneous determination of unreasonable management judgment and provides no reasoned or careful analysis of the evidence bearing upon this matter.

(2) As evidenced by its general and non-specific discussion of PECO's 1976 and 1978 Limerick scheduling decisions (August 27 Order, pp. 15-17), Respondent has not properly applied

its "reasonable man standard". Said standard, as recognized by Respondent (August 27 Order, p. 14), requires that Respondent examine the reasonableness of each PECO scheduling decision individually against the facts and circumstances and knowledge of PECO at the time said decision was made. Respondent's failure to discuss said decisions individually, and its effort to apply the same generalizations to each decision, as well as the following evidence the arbitrary and capricious nature of this "finding":

i) Although Respondent finds that PECO was not "reasonable" in part because it did not "compress the construction schedule" of Limerick, Respondent has made no finding that PECO possessed in 1976 and 1978 the financial and technical capability to build Limerick to a more rapid schedule than that employed. In fact, the Order admits that financial constraints required the delay decisions.

ii) No evidence of any kind was offered in support of the proposition that a "reasonable man" would have terminated Limerick 2 construction in 1976, and such evidence as was offered relative to 1978 was demonstrated to be in error.

iii) Respondent does not even discuss in its decision the best and only true evidence of what a "reasonable man" would do when faced with the problems and pressures faced by PECO in 1976 and 1978, i.e., statistical evidence that a substantial majority of utility managers deferred nuclear plant construction at about the same time and for the same reasons as did PECO.

(3) Respondent's conclusion that PECO's 1976 and 1978 decisions deferring plant completion were not reasonable is in conflict with its own determination to impose an additional deferral now as being "in the public interest" as one alternative imposed on PECO.

(4) Respondent's conclusion that Limerick completion deferral in 1976 and 1978 was not reasonable is in conflict with

its failure to disapprove PECO's 1976 and 1978 deferral decisions at R.I.D. 438 and Docket No. R-79060865 and with its failure to order plant cancellation at Docket No. R-79060865 though requested to do so (See R.I.D. 438 ALJ Order, pp. 148-51; Docket No. R-79060865 Order, pp. 15-16). Further, its conclusion that a "reasonable man" would have compressed the Limerick construction schedule is inconsistent with its rejection of PECO's request at Docket No. R-79060865 to be granted additional revenues to permit the financing of a two year compression in said schedule.

12. Respondent's findings and conclusions as to matters not noticed by Respondent and as to which no specific evidence was presented deny PECO its right to notice and a fair hearing guaranteed by the Public Utility Code (66 Pa. C.S. § 331), the Pennsylvania Constitution (Art. 1, §§ 1 and 9), and the due process clause of the 14th Amendment of the U.S. Constitution. Said improper findings and conclusions are as follows:

(a) That "completion of Limerick Unit 2 by 1987 is not financially feasible". The investigation record is entirely silent as to the specific level of "necessary revenues" which would be sufficient to permit Limerick 2 completion in 1987. All probative and quantified financial analyses presented in the record establish that such completion is feasible. In its Order, the Commission fails entirely to discuss this evidence, but rather cites selected passages from PECO's testimony in support of its request for Limerick CWIP in rate base at Docket No. R-

811626. Said testimony does not analyze PECO's financial condition against Limerick 2 capital requirements in any manner to support Respondent's "financial infeasibility" conclusion.

(b) That "suspension of construction at Limerick Unit 2 would be in the public interest". Said finding is made without benefit of any record evidence as to the costs or other disadvantages of said delay, or as to the level of its purported benefits. Respondent's Investigation Order and Notice failed to list this matter as a subject of its Investigation, nor was plant deferral proposed as a viable alternative to Limerick 2 completion in 1987 by any expert witness or party to the Investigation.

WHEREFORE, Petitioner, Philadelphia Electric Company, respectfully requests that this Honorable Court:

1. find that Respondent has exceeded its jurisdiction or authority and has erred as described above:

(a) by seeking to exercise jurisdiction over PECO's plant construction activities, except to the limited extent provided by the Public Utility Code;

(b) by requiring PECO either to cancel Limerick 2 without knowing what disposition will be made of the $461 million investment already made in Limerick 2 and the substantial investment in Unit 2 associated common plant or to defer completion of Limerick 2 without knowing whether and the extent to which resulting increased costs may be recovered through service rates;

(c) by seeking to impose delay or cancellation of construction of Limerick 2 by threatening future rate adjustments when PECO claims Limerick 2 in rate base;

(d) by disapproving the issuance of security certificates to prevent use of the proceeds derived from sale of securities for construction of Limerick 2; and

2. review and set aside the Order of the Pennsylvania Public Utility Commission entered August 27, 1982 at Docket No. I-80100341, direct that errors made in the said Order as noted above be corrected, and grant such further relief as may be just and reasonable, including if necessary the exercise of any equitable jurisdiction which your Honorable Court may deem appropriate.

Respectfully submitted,

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Walter R. Hall, II
David B. MacGregor
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Dated: September 23, 1982

IN THE
COMMONWEALTH COURT OF PENNSYLVANIA

PHILADELPHIA ELECTRIC COMPANY Petitioner v. PENNSYLVANIA PUBLIC UTILITY COMMISSION, Respondent	:	No. 2365 Commonwealth Court Docket 1982

N O T I C E

If you intend to participate in this proceeding in the Commonwealth Court, you must serve and file a notice of or application for intervention under Pennsylvania Rule of Appellate Procedure 1531 within 30 days.

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DATED: September 23, 1982

COMMONWEALTH COURT OF PENNSYLVANIA

PHILADELPHIA ELECTRIC COMPANY, Petitioner	:	No. 2365 Commonwealth Docket 1982
v.	:	
PENNSYLVANIA PUBLIC UTILITY COMMISSION, Respondent	:	

CERTIFICATE OF SERVICE

I hereby certify that I am this day serving the foregoing document upon the persons listed and in the manner indicated on the attached service list, which service satisfies the requirements of Pa. R.A.P. 121 and Pa. R.A.P. 1514(c).

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I hereby certify that I am this 6th day of January, 1986, serving the foregoing documents, either personally or by first-class mail, upon the persons addressed below:

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Pennsylvania Public Utility Commission

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SECRETARY'S OFFICE
Public Utility Commission

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

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DOCKET
JAN 07 1986

Pennsylvania Public Utility Commission, et al.	:	
v.	:	R-850152 etc.
Philadelphia Electric Company	:	

ENTRY OF
APPEARANCES

DOCKET

To the Secretary:

Kindly enter the appearances of

Bernard A. Ryan, Jr.
Dechert Price & Rhoads
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Harrisburg, PA 17102
(717) 233-7947

and

George J. Miller
Dechert Price & Rhoads
3400 Centre Square West
1500 Market Street
Philadelphia, PA 19102
(215) 972-3456

as attorneys for the Pennsylvania Food Merchants Association in this proceeding. Copies of all pleadings, testimony and other papers filed in this case should be served on the undersigned at the firm's Harrisburg office listed above.

Dated: January 6, 1986.

Bernard A. Ryan, Jr.
Attorney for Pennsylvania Food
Merchants Association

cc: All Active Parties of Record

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JAN7 1986

SECRETARY'S OFFICE
Public Utility Commission

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

PENNSYLVANIA PUBLIC UTILITY COMMISSION	:	
	:	
v.	:	Docket No. R-850152
	:	
PHILADELPHIA ELECTRIC COMPANY	:	
	:	

RESPONSE TO ANSWER OF PHILADELPHIA ELECTRIC COMPANY TO GOVERNOR'S ENERGY COUNCIL REQUEST FOR POSTPONEMENT OF FILING DATE OF PHASE-IN TESTIMONY

The Governor's Energy Council ("GEC" or "GEC staff") hereby files its Response to the Answer of Philadelphia Electric Company ("PECO" or "the Company") to the GEC Request for Postpnnement of the filing date of GEC testimony on phase-in. The Company filed its Answer on January 2, 1986. The purpose of this brief Response is to clarify and rebut certain matters in the Company's answer. In support thereof, the GEC respectfully represents the following:

1. As an initial matter, the GEC opposes the Company's view that interrogatories served before the prehearing conference in this case are timely answered if responded to within 15 days after the prehearing conference (Company Answer, para. 3). Under 52 Pa. Code 5.331, the GEC was entitled to begin discovery as of its application for participant status in this proceeding. The GEC did so, filing Set I of its interrogatories on November 8, 1985, the day after it filed its petition to intervene. In accordance with 52 Pa. Code 5.342(d), answers to these interrogatories, and those in Set II as well, were due within 15 days.

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2. Contrary to the Company's view, the GEC Request is not based solely on the lateness of the answers to GEC Interrogatories Set II, Nos. 12, 13 and 15. The GEC Request relies also on the lateness of the responses to GEC Set I and other portions of GEC Set II (GEC Request, paras. 3-5, 8).

3. The materiality of the interrogatories in question to testimony on phase-in is clear from a simple reading of the text of the interrogatories, particularly in the case of Set I. Further, the question of materiality of interrogatory answers to a party's testimony is uniquely within the purview of the party propounding the interrogatory. It was surely not the intent of the Prehearing Order in this case to require a party to "spell out" the elements of its case in order to obtain a postponment of testimony. Yet that would be the result if the GEC had to establish the materiality of the interrogatories in question in the manner suggested by the Company in its Answer.

4. There is obviously "harm" to GEC from the late filing of the interrogatory responses in question. GEC Set I is a case in point. Looking at GEC Set I, it is clear that a number of the questions (e.g., Nos. 2, 4, 6, 8, 10, 12, 14) request basic Company data as forecasted for a period of years. The GEC propounded these general interrogatories early in this case and well before the prehearing conference in order to havessufficient time for follow-up discovery once this basic data had been supplied and analyzed. Particularly in the context of a rate case, time is of the essence; parties must work

quickly to obtain and analyze information in developing their positions and testimony on the issues. When its discovery is answered only a few days late, a party may still be able to complete its analysis on schedule. But this is not the case when material, basic data is provided nearly two weeks late. Here the GEC lost valuable time needed for its analysis because the Company's responses were late and, in the case of GEC Set I, because they were incomplete (GEC Request, para. 4). Notably, the Company does not dispute this last point in its Answer.

5. The Prehearing Order in this case does not condition a postponement of testimony on a finding of fault by the party that files late answers. PECO's argument that it had no "control" over the lateness of these answers is therefore not pertinent. It is also difficult to conceive where responsibility lies for providing answers to discovery if such responsibility does not lie with the Company.

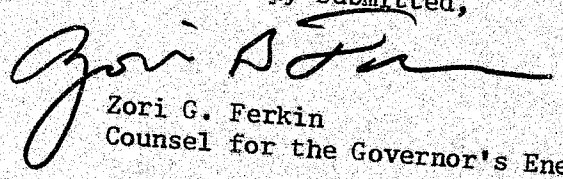
6. a. The GEC request for an eight-day extension is reasonable given the lateness of the Company's answers and should be granted. The schedule for this rate case allows for the Company to cross-examine intervenor testimony on "Limerick" issues, including phase-in, up to and including February 14, 1986, more than three (3) weeks after the GEC phase-in testimony would be filed under the requested extension.

b. Should the Administrative Law Judge decide to accept PECO's argument that the eight-day extension is too long (Company Answer, para. 4(e)), the GEC requests the following alternative be considered. The extension requested by the GEC would have the GEC files its phase-in testimony on January 22, 1986, in conjunction with rate structure testimony

by Trial Staff, OCA and other intervenors. The Administrative Law Judge should grant this extension, and then adjust the Company's date for cross-examination of the GEC phase-in testimony to the date established for cross-examination of intervenor rate structure testimony (February 18-21, 1986). The schedule for rebuttal and surrebuttal testimony could also be adjusted to that already established for rate structure issues. Thus rebuttal to the GEC phase-in testimony would be filed February 26, 1986, and surrebuttal testimony would be due March 5, 1986.

WHEREFORE, the GEC requests that the Administrative Law Judge postpone the filing date for GEC testimony on phase-in issues to January 22, 1986.

Respectfully submitted,



Zori G. Ferkin
Counsel for the Governor's Energy Council

P.O. Box 8010
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Dated: January 6, 1986

General Services Administration
General Counsel
Washington, DC 20405

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SECRETARY'S OFFICE
Public Utility Commission

January 8, 1986

Mr. Jerry Rich, Secretary
Pennsylvania Public Utility Commission
Room G-18, North Office Building
North & Commonwealth Avenue
Harrisburg, Pennsylvania 17120

Dear Mr. Rich:

Re: Pennsylvania Public Utility Commission, et al.
v.
Philadelphia Electric Company
Docket No. R-850152

Enclosed for filing with the Commission are three (3) copies of the Testimony and Exhibits of David E. Kelley, on Adjustment to O&M Expenses, General Services Administration, on behalf of the Federal Executive Agencies.

Sincerely,

Mildred E.V. Pitts

MILDRED E.V. PITTS
Senior Trial Attorney
Information Resources & Utilities Division

Enclosures

cc: Honorable Joseph P. Matuschak
Administrative Law Judge
Pennsylvania Public Utility Commission

All Parties

DOCUMENT
FOLDER

CERTIFICATE OF SERVICE

Re: Pennsylvania Public Utilities Commission, et al.
v.
Philadelphia Electric Company
Docket No. R-850152

I hereby certify that I am, this 8th day of January, 1986 serving either by special messenger or by first-class mail, the foregoing document, General Services Administration's Testimony and Exhibits of David E. Kelley, upon the persons listed below:

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Administrative Law Judge
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GSA STATEMENT No. 2

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SECRETARY'S OFFICE
Public Utility Commission

PENNSYLVANIA PUBLIC UTILITY COMMISSION

V.

PHILADELPHIA ELECTRIC COMPANY

DOCKET NO. R-850152

Testimony of

DAVID E. KELLEY

Adjustement to O&M Expenses

General Services Administration
on Behalf of the Federal Executive Agencies

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Room 6317
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(202) 566-1034

January 9, 1986

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DIRECT TESTIMONY OF DAVID E. KELLEY

Q: PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A: My name is David E. Kelley. My business address is Office of Public Utilities, Public Buildings Service, General Services Adminstration, 18th & F Streets, N.W., Washington, D.C. 20405

Q: WHAT IS YOUR POSITION WITH THE GENERAL SERVICES ADMINISTRATION?

A: I am an Operation Research Analyst in the Office of Public Utilities. My duties include analysis of rate case issues, such as capital structure, rate of return, disparities among class rates of return, and time of use rates. I also present testimony on the above issues. I am the project manager for auditing Federal customer bills in order to determine the most cost effective rate schedule. A statement of my educational background and professional experience is contained in Appendix A of the testimony.

Q: WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A: The purpose of my testimony is to recommend an adjustment to Operation and Maintenance (O&M) expenses for the test year ended June 30, 1986. PECO has increased some O&M expenses by

a corporate inflation factor of 5.8%. I recommend an inflation factor of 3.3%. I recommend a decrease to PECO O&M expenses of $7,439,000 as a result of using the inflation factor of 3.3% instead of PECO's inflation factor of 5.8%.

Q: WHAT IS YOUR BASIS FOR DETERMINING THAT PECO HAS OVERESTIMATED THE INCREASE DUE TO INFLATION FOR TEST YEAR O&M EXPENSES?

A: PECO has estimated a corporate inflation factor of 5.8% for use when increases to O&M expenses are unknown. Using the GNP implicit price deflator as a measure of inflation, an unbiased estimate of inflation during the test year ended June 30, 1986 is 3.3%. The inflation estimate of 3.3% is based on actual inflation and the average of 50 well known econometric forecasters (Schedule 1). So PECO has overstated inflation by 2.5%, and the excessive inflation rate causes an overestimate in O&M expenses whenever it is applied.

Q: WHAT IS THE BASIS FOR YOUR RECOMMENDATION THAT PECO'S INFLATION ESTIMATE IS TOO HIGH?

A: The amount estimated by PECO using the 5.8% corporate inflation factor is excessive because actual inflation, as measured by the GNP implicit price deflator, is more than three percent below the inflation rate estimated by PECO for

the same period, while the inflation rate forecast by 50 well known econometric forecasters in Blue Chip Economic Indicators, December 10, 1985 is about two percent below the PECO inflation rate estimate for the same period.

PECO estimated inflation at 5.25% for 1985, while inflation, as measured by the GNP implicit price deflator, was 2.3% in the third quarter of 1985. The third quarter of 1985 represents the beginning of the test year ended June 30, 1986. The average inflation forecast of 50 well-known econometric forecasters in Blue Chip Economic Indicators, December 10, 1985 is 2.9% for the last half of 1985, well below the inflation estimate of 5.25% made by PECO. PECO estimated inflation at 6.4% for 1986, while the average of about 50 well-known econometric forecasters in Blue Chip Economic Indicators, December 10, 1985, is 3.7% for the first half of 1986. For the test year ended June 30, 1986, PECO has estimated a composite inflation rate of 5.8%, while the composite of actual inflation and the average inflation forecasts of about 50 well-known econometric forecasters in Blue Chip Economic Indicators, December 10, 1985, is 3.3%. Thus, PECO has likely overestimated inflation by more than 2%.

Q: HOW HAS PECO'S HIGH ESTIMATE OF INFLATION RESULTED IN OVERESTIMATING THE EFFECT OF INFLATION ON O&M EXPENSES?

A: The high inflation estimate of 5.8% is used by PECO to increase FERC accounts between 500 and 556 and other accounts for the test year ended June 30, 1986. The amount in each FERC account that is increased by 5.8% is not known, so it is necessary to estimate the increases resulting from PECO's use of the 5.8% inflation factor. PECO uses the 5.8% inflation factor when the actual increase for the test year is unknown. For example, if all increases in O&M expanses are unknown, the increase from applying a 5.8% inflation factor is roughly $82,000,000 (Schedule 2).

The inflation estimate of 5.8% is too high. Using the GNP implicit price deflator as a measure of inflation, an accurate estimate of inflation for the test year is 3.3%, based on actual inflation and the average forecast of 50 econometric forecasters. Assuming that all increases for the test year are unknown, the increase to O&M expenses for inflation of 3.3% is roughly $48,000,000 (Schedule 3). There is a difference, in the case where all increases in O&M expenses are unknown, of $34,000,000. Although $34,000,000 overstates the effect of PECO's overestimate of inflation, since many test year increases are probably known, this

example shows that PECO's high inflation factor can have a dramatic effect on test year O&M expenses.

Q: HAS PECO PROVIDED DATA IN THIS CASE THAT SHOWS WHAT PROPORTION OF O&M EXPENSES ARE INCREASED BY THE 5.8% INFLATION FACTOR?

A: No. PECO does not know the amounts increased by the 5.8% inflation factor. This is clear from IR-GSA-1-44, shown below.

> "Q: Reference the table found on page 8 of PECO Statement No. 19. Identify by account number and description, all expenses to which PECO has applied these inflation factors."
>
> "A: Identification by account is not possible due to the decentralized nature of the budget process and the fact that the General Inflation factor is offered as an alternative to specific known or anticipated costs changes."

Q: HOW HAVE YOU ESTIMATED THE AMOUNT OF TEST YEAR O&M EXPENSES THAT RESULTS FROM PECO USING A 5.8% INFLATION FACTOR INSTEAD OF THE 3.3% INFLATION FACTOR YOU RECOMMEND?

A: The high inflation estimate of 5.8% is used by PECO to increase FERC accounts for amounts where the increase, for the test year ended June 30, 1986, is unknown. The amount in each FERC account that is increased by 5.8% is not known, so it is necessary to estimate the effect of PECO's use of the 5.8% inflation factor.

I recommend that the major variances for test year ended June 30, 1986 over test year ended June 30, 1985, attributed to inflation, be adjusted to reflect the inflation estimate of 3.3% instead of the inflation estimate of 5.8% used by PECO. The total of major variances attributed to inflation is $17,259,000 (Schedule 4). This amount is reduced by $7,439,000 to reflect the 3.3% inflation estimate instead of the 5.8% inflation estimate (Schedule 5).

Q: WHY DO YOU RECOMMEND REDUCING ONLY THE MAJOR VARIANCES IN THE TEST YEAR BUDGET, ATTRIBUTED TO INFLATION?

A: Decreasing the amounts for O&M expenses for the test year by $7,439,000 corrects for the overestimate due to PECO's high inflation estimate. Viewing the major variances due to

inflation as a proportion of total O&M expenses, the major variances are about 1/5 of the total (Schedule 6) Reducing only the inflation increases shown as major variances takes into account the likelihood that known increases represent a large proportion of the increases in O&M expenses due to inflation. When there is a known increase, the 5.8% inflation factor is not applied. PECO has not shown the actual proportion of O&M expenses increased by their 5.8% inflation factor. The major variances due to inflation are a reasonable amount to be adjusted downward to compensate for the effect of PECO's use of an inflation factor of 5.8%. As previously stated in my testimony (see pp. 2, et seq.) 3.3% is a more reasonable estimate of the inflation factor at issue.

Q: DO YOU HAVE A RECOMMENDATION FOR IMPROVING THE ACCURACY OF ESTIMATES FOR THE EFFECT OF INFLATION ON O&M EXPENSES IN A PARTIALLY FORECASTED TEST YEAR?

A: Yes. PECO's use of an inflation estimate, without knowing the amounts to which it is applied, causes a severe problem for determining accurate test year levels. Inflation rates are seldom forcasted well. To improve the accuracy of test year levels for O&M expenses, I recommend that PECO determine

a reasonable estimate of the increases that result from applying the corporate inflation factor in future rate case filing.

Q: DOES THAT CONCLUDE YOUR TESTIMONY?

A: Yes.

APPENDIX A

EDUCATIONAL AND PROFESSIONAL SUMMARY

NAME: David E. Kelley

EDUCATION:

AB in Pure Mathematics, August 1977
University of California at Berkeley.

MS in Applied Mathematics, with a Minor in Economics, September 1981
George Washington University.

EMPLOYMENT:

Operations Research Analyst
Regulatory Intervention Division
Office of Public Utilities
Public Buildings Service
General Services Administration
Washington, D.C.
September 1982 to present.

Operations Research Analyst
Regulatory Intervention Division
Office of Public Utilities
Transportation and Public Utilities Service
General Services Administration
Washington, D.C.
June 1980 to September 1982.

Operations Research Analyst
Management Planning and Review Division
Office of the Executive Director
Transportation and Public Utilities Service
General Services Administration
Washington, D.C.
August 1979 to June 1980.

Operations Research Analyst
Policy and Programs Division
Office of the Executive Director
Public Buildings Service
General Services Administration
Washington, D.C.
August 1977 to August 1979.

PARTICIPATION IN REGULATORY PROCEEDINGS

Case	Issue	Date
Texas Power & Light Company Docket No. 3780	Effect of market pressure and flotation costs on the cost of common equity.	May 1981
Public Service Company of Colorado Docket No. 1525	Effect of market pressure and flotation costs on the cost of common equity.	October 1981
Philadelphia Electric Company Docket No. R-811626	Effect of market pressure and flotation costs on the cost of common equity.	November 1981
Texas Power & Light Company Docket No. 4321	Effect of market pressure and flotation costs on the cost of common equity.	April 1982
Washington Gas Light Docket No. 787	Cost of Capital.	August 1982
Potomac Electric Power Company Docket No. 7662	Cost of Capital.	November 1982
Baltimore Gas & Electric Co. Docket No. 7695	Cost of Capital.	March 1983
Public Service Electric & Gas Co. Do. 837-620	Cost of Capital.	September 1983
Commonwealth Edison Co. Docket No. 83-0537	Cost of Capital.	February 1984
Potomac Electric Power Co. Docket No. 813	Cost of Capital.	April 1984

PARTICIPATION IN REGULATORY PROCEEDINGS

Commonwealth Edison Co. Docket No. 83-0537 & 84-0555	Cost of Capital.	May 1985
Potomac Electric Power Co. Docket No. 834	Time of Day Rates	July 1985
Oklahoma Gas & Electric Co. Docket. No. 29450	Equalization of Class Rates of Return	July 1985
Potomac Electric Power Co. Docket No. 7874	Time of Day Rates	July 1985
Potomac Electric Power Co. Docket No. 813	Equalization of Class Rates of Return	August 1985

GSA STATEMENT No. 2

PENNSYLVANIA PUBLIC UTILITY COMMISSION

V.

PHILADELPHIA ELECTRIC COMPANY

DOCKET NO. R-850152

Exhibits of

DAVID E. KELLEY

Adjustment to O&M Expenses

General Services Administration
on Behalf of the Federal Executive Agencies

General Services Administration (PUR)
Room 6317
18th & F Streets, N.W.
Washington, DC 20405
(202) 566-1034

January 9, 1986

Schedule 1

ESTIMATE OF INFLATION FOR THE TEST YEAR ENDED JUNE 30, 1986

GNP Implicit Price Deflator

Actual Annaul Rate

1985 3rd Quarter	2.3%

Forecasted Annual Rate, Blue Chip Consensus [1]

1985 4th Quarter	3.6%
1986 1st Quarter	3.6%
1986 2nd Quarter	3.8%

Inflation rate for period from 1985, 3rd Quarter to 1986, second quarter is $(1.023)^{1/4}$ $(1.036)^{1/4}$ $(1.036)^{1/4}$ $(1.038)^{1/4}$ = 1.033
i.e. a 3.3% inflation rate.

[1]/ From Blue Chip Economic Indicators, December 10, 1985, 50 econometric forecasters.

Schedule 2

ESTIMATE OF EFFECT OF USING 5.8% INFLATION
FACTOR WHEN ALL INCREASE ARE UNKNOWN

The total of O&M expenses is $1,502,703,000 (p. A-1, TPH-2). If all increase are unknown, the amount of increases due to inflation is $1,502,703,000-($1,502,703,000/1.058)=$82,378,800.

Schedule 3

ESTIMATE OF EFFECT OF USING 3.3% INFLATION FACTOR WHEN ALL INCREASES ARE UNKNOWN

The total for O&M expenses is $1,502,703,000.(p.A-1, TPH-2). If all increases are unknown, the total amount of increase due to inflation is $1,502,703,000-($1,502,703,000/1.033) = $48,005,030.

Schedule 4

MAJOR VARIANCES DUE TO INFLATION FOR TEST YEAR ENDED JUNE 30, 1986 OVER TEST YEAR ENDED JUNE 30, 1985

FERC Account No.	Increase Due to Inflation for Test Year Ended June 30, 1986 over Test Year Ended June 30, 1985 ($1,000's)
500	834
502	2,090
510	526
511	496
512	3,548
517	698
524	2,190
529	203
530	926
531	550
532	298
553	341
556	332
902	719
903	1,910
920	1,598
TOTAL	17,259

From PECO Supplement No. 15, Attachment II-D-1b, Sheets 1-6.

Schedule 5

REDUCTIONS TO MAJOR VARIANCES DUE TO INFLATION FOR TEST YEAR ENDED JUNE 30, 1986 OVER TEST YEAR ENDED JUNE 30, 1985

FERC Account No.	Reduction to Inflation Amount in Schedule 4 to Reflect Inflation Rate of 3.3% Instead of the Inflation Rate of 5.8% ($1,000's) [1]
500	359
502	901
510	227
511	214
512	1,529
517	301
524	944
529	88
530	399
531	237
532	128
553	147
556	143
902	310
903	823
920	689
TOTAL	7,439

[1] The reduction is calculated as follows:

Reduction = (Schedule 4 amount) x (1-.033/.058).

Schedule 6

PROPORTION OF MAJOR VARIANCES DUE TO INFLATION TO TOTAL INCREASE DUE TO INFLATION IN O&M EXPENSES FOR TEST YEAR ENDED JUNE 30, 1986 OVER TEST YEAR ENDED JUNE 30, 1985

Major variances due to inflation are $17,259,000 (Schedule 3). Total variances due to inflation are $82,378,800 (Schedule 2). The proportion of major variances due to inflation to total increases due to inflation for O&M expenses is $17,259,000/$82,378,800 = .21, i.e., roughly 1/5.

COMMONWEALTH OF PENNSYLVANIA
PENNSYLVANIA PUBLIC UTILITY COMMISSION
P.O. BOX 3265, HARRISBURG, PA 17120
January 9, 1986

In re: R-850152

(See attached lists)

Pennsylvania Public Utility Commission, et al.
vs.
Philadelphia Electric Company

N O T I C E

This is to advise that the hearing in the captioned proceeding scheduled for January 21, 1986 is cancelled. Hearing will be held, as previously scheduled, on Wednesday, January 22, 1986, at 10:00 a.m., at Philadelphia.

It has been decided that the additional further hearings will be held as follows:

Tuesday through Friday	- January 28, 29, 30 & 31, 1986	- Harrisburg
Wednesday through Friday	- February 5, 6 & 7, 1986	- Philadelphia
Monday through Friday	- February 10, 11, 12, 13 & 14, 1986	- Harrisburg
Tuesday through Friday	- February 18, 19, 20 & 21, 1986	- Philadelphia
Tuesday	- February 25, 1986	- Harrisburg
Wednesday through Friday	- March 5, 6 & 7, 1986	- Harrisburg
Monday through Friday	- March 10, 11, 12, 13 & 14, 1986	- Harrisburg

All hearings will commence at 10:00 a.m.

Those in Harrisburg will be held in available hearing room, Ground Floor, North Office Building, and those in Philadelphia will be held in Room 1306, Philadelphia State Office Building, Broad and Spring Garden Streets.

Public Input Hearings will be held as scheduled in our notice dated January 2, 1986.

Administrative Law Judge Joseph P. Matuschak will be the presiding officer in this case. Judge Matuschak's telephone number is (412) 437-3409. His address is 97 East Main Street, Uniontown, Pennsylvania 15401.

PLEASE NOTE - In any scheduled hearings of two or more consecutive days, if testimony scheduled for that sequence of hearings is concluded in less time, any subsequent date in that sequence is subject to cancellation without advance notice.

cc: Judge Matuschak
Law Bureau
Bureau of Rates
Mr. Bramson
Ms. Dickson
Ms. Crouse
File Room

DOCUMENT FOLDER

DOCKETED
JAN 21 1986

R-850152 - Parties of Record:

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(C002-David M. Barasch, Consumer Advocate)

Janet Parrish, Esquire
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Association, International, Inc.)

Zori G. Ferkin, Legal Counsel
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C008-Southeastern Pennsylvania Transportation Authority)

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Rafael Caminero, Esquire
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(petition to intervene)

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R-850152 - Parties in interest:

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Member, Pennsylvania Senate
P. O. Box 1750
Media, Pennsylvania 19063

Rick Etheridge
Attn: Code 111
Chesapeake Division
Naval Facilities Engineering Command
Washington Navy Yard - Building 212
Washington, D.C. 20374

Joseph J. Lynch
31 Harvard Road
Norristown, Pennsylvania 19401

COMMONWEALTH OF PENNSYLVANIA
PENNSYLVANIA PUBLIC UTILITY COMMISSION
P. O. BOX 3265, HARRISBURG, Pa. 17120

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January 10, 1986

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SECRETARY'S OFFICE
Public Utility Commission

Jerry Rich, Secretary
Pa. Public Utility Commission
New Filing Section
P.O. Box 3265
Harrisburg, PA 17120

In re: Pennsylvania Public Utility Commission
v.
Philadelphia Electric Company
R-850152

DOCUMENT

Dear Secretary Rich:

Enclosed for filing please find an original and nine copies of Trial Staff's Brief in Support of Staff's Motion to Strike for filing in the above captioned matter. Also enclosed is the original and three copies of Trial Staff's Answer to the Company's Petition for Stay in the above captioned matter. Copies have been served upon the Administrative Law Judge and the other parties.

Very truly yours,

D. P. Delaney

Daniel P. Delaney
Deputy Chief Counsel

DPD:cew

Enc.

cc: Honorable Joseph P. Matuschak
Service List

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BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION
The Honorable Joseph P. Matuschak Presiding

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JAN 10 1986
SECRETARY'S OFFICE
Public Utility Commission

PENNSYLVANIA PUBLIC UTILITY COMMISSION :
:
v. : Docket No. R-850152
:
PHILADELPHIA ELECTRIC COMPANY :

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JAN 1 1986

ANSWER TO PETITION FOR STAY

AND NOW COMES the Trial Staff of the Pennsylvania Public Utility Commission ("Staff"), by its Counsel, and files this Answer to the Petition for Stay of the Philadelphia Electric Company (PECO or the company), and respectfully represents as follows:

DOCUMENT
FILE

1. Admitted.

2. Admitted. By way of further response, the Presiding Officer also incorporated into the instant record those portions of the prior Limerick record concerning the Company's construction deferral decisions.

3. Admitted and denied in part. It is admitted that PECO filed a Petition for Commission Review and Answer To A Material Question on December 26, 1985. It is denied that PECO has submitted a Material Question that is responsive to the Presiding Officer's Ruling or the Staff's Motion. It is further denied that PECO has suffered or will suffer any violation of its due process rights and that there will be any disruption to the orderly conduct of this rate proceeding.

4. Admitted. By way of further answer, Staff notes that the language of Section 331(e), 66 Pa. C.S. §331(e), only permits the presiding officer to stay the entire proceeding.

5. Denied. Staff denies that the granting of the stay will protect any substantial rights involved in the instant proceeding. The schedule for preparation of testimony and hearings, alluded to in PECO's Petition for Stay, was made at a prehearing conference on December 3, 1985. Chronologically, the prehearing conference followed the filing of the Staff's Motion in Limine. Therefore, Staff submits that the schedule was agreed to with notice of the pending motion and with the objective to avoid relitigation of the prudency issue. Not only is the schedule demanding, but the interests of administrative efficiency require that previously litigated issues be bypassed in this proceeding.

Moreover, PECO has not alleged nor can it demonstrate compliance with any criteria as defined by the Pennsylvania Supreme Court necessary for the granting of a stay. Pennsylvania Public Utility Commission v. Process Gas Consumers Group, 502 Pa. 545, 467 A. 2d 805 (1983).

There is no danger that the record in this proceeding will be incomplete because the Administrative Law Judge has incorporated by reference those portions of the record at Docket No. I-80100341 which relate to the decisions of the Philadelphia Electric Company to initially construct the Limerick Nuclear Generating Station and to delay construction of Limerick in 1974, 1976 and 1978. (N.T. 1374.).

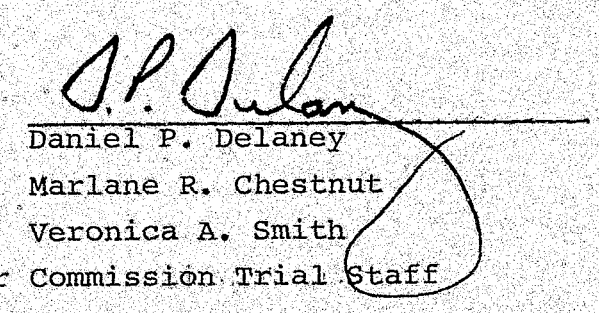
Staff notes that Section 331(e) is the only authority cited by PECO as a basis for granting the requested stay. The language of Section 331(e) permits the presiding officer to stay the whole proceeding. Therefore, PECO's reliance upon the statute as authority to support its request to stay only the effect of the ruling on the Motion in Limine is misplaced. The statute does not allow the presiding officer the discretion to grant the requested remedy. In the alternative, Staff will agree to a stay for the whole proceeding in accordance with Section 331(e) only upon the condition that PECO agree not to implement any new tariff at the end of the seven month suspension for a period of time equal to or not less than the period of time necessary to resolve PECO's alleged material question by both the Commission and any subsequent appellate review of that decision.

Additionally, it must be noted that to grant the partial stay requested by the Company would completely frustrate one of the Commission's purposes in initiating the 1980 Limerick Investigation: to examine the complex issue of the Company's deferral decisions without the time pressures resulting from the application of statutory suspension periods. That proceeding consumed 38 hearing days and produced 4,000 pages of transcript. What the Company now proposes is to force the relitigation of this issue within the limited hearing period left in this case. Such a proposal evidences not only a cavalier attitude towards the Commission and the efficacy of its prior findings but also a complete disregard for

administrative efficiency and economy. The instant Motion attempts to achieve what both the Public Utility Code and the Presiding Officer prohibited: the relitigation of a previously decided issue which was not reversed or modified on appeal. The Company has failed completely to advance any reasons why the Presiding Officer's order of December 20, 1985 should be stayed in any respect.

WHEREFORE, for the reasons above Staff requests that the Administrative Law Judge deny the Petition for Stay of the Philadelphia Electric Company.

Respectfully submitted,



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Harrisburg, PA 17120
(717) 783-3190

Daniel P. Delaney
Marlane R. Chestnut
Veronica A. Smith
For Commission Trial Staff

CERTIFICATE OF SERVICE

I hereby certify that I am this 10th day of January, 1986, serving the foregoing documents, either personally or by first-class mail, upon the persons addressed below:

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Zori G. Ferkin, Legal Counsel
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Trial Attorney
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Martha W. Bush, Esquire
237 S. Melville Street
Philadelphia, PA 19139

Daniel P. Delaney
For Pennsylvania Public Utility Commission

COMMONWEALTH OF PENNSYLVANIA
PENNSYLVANIA PUBLIC UTILITY COMMISSION
P. O. BOX 3265, HARRISBURG, Pa. 17120

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Dear Secretary Rich:

Enclosed for filing please find an original and nine copies of Trial Staff's Brief in Support of Staff's Motion to Strike for filing in the above captioned matter. Also enclosed is the original and three copies of Trial Staff's Answer to the Company's Petition for Stay in the above captioned matter. Copies have been served upon the Administrative Law Judge and the other parties.

Very truly yours,

D. P. Delaney

Daniel P. Delaney
Deputy Chief Counsel

DPD:cew

Enc.

cc: Honorable Joseph P. Matuschak
Service List

DOCUMENT

ORIGINAL

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

THE HONORABLE JOSEPH P. MATUSCHAK PRESIDING

PENNSYLVANIA PUBLIC UITLITY COMMISSION	:	
	:	Docket No.
v.	:	R-850152
PHILADELPHIA ELECTRIC COMPANY	:	

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JAN 10 1986

SECRETARY'S OFFICE
Public Utility Commission

BRIEF OF TRIAL STAFF IN SUPPORT OF ITS MOTION TO STRIKE

Brief in Support of Trial Staff's Motion to Strike filed pursuant to the Presiding Officer's Ruling on the Staff's Motion in Limine.

Daniel P. Delaney
Marlane R. Chestnut
Veronia A. Smith

Counsel for Commission Trial Staff

Pennsylvania Public Utility Commission
P. O. Box 3265
Harrisburg, PA 17120
(717) 783-3190

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JAN 14 1986

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APPENDIX 1

Pages 15 to 55 of Administrative Law Judge Joseph J. Klovekorn's Initial Decision in the Limerick Nuclear Generating Station Investigation, I-80100341 (1982)

STATEMENT OF THE CASE

On November 20, 1985 Staff filed a Motion in Limine in the above-captioned case. In its Motion Staff requested that the Commission's prior finding (in the Commission's 1980 Limerick Investigation at I-80100341) of unreasonableness or imprudency in PECO's decisions to delay construction of the Limerick Units in 1976 and 1978 be considered prima facie evidence of the facts found and conclusive upon the parties to the present proceeding. While the Motion was pending, several hearings were held. Staff moved repeatedly during those hearings to strike any testimony offered by PECO which addressed the prudency of the 1976 and 1978 Limerick construction delays.

More specifically, Staff orally moved to strike parts of the testimony of six witnesses offered by PECO. The names of those witnesses and their statement numbers are listed below in the chronological order in which their testimony was presented:

	Witness Name	Statement No.	Testimony date
1.	Hieronymus	15	12/16/85
2.	Perl	11	12/16/85
3.	Boyer	1	12/17/85
4.	Kononetz	8	12/19/85
5.	Abrams	10	12/20/85
6.	Paquette	3	12/20/85

After hearing oral argument on the Motion, Judge Matuschak granted the Staff's Motion on December 20, 1985 in a bench decision. (N.T. 1370-1375). On January 3, 1986

Staff submitted a written Motion to Strike which designated those portions of the witnesses's statements, exhibits, schedules and cross-examinations which, based on the Judge's ruling, should be stricken from the record. This brief is submitted in support of Staff's written Motion to Strike.

STATEMENT OF THE ISSUE

Should not all evidence which is similar to the evidence submitted by PECO and the other parties in the Commission Investigation at Docket No. I-80100341 to justify and/or explain the company decisions to delay construction of Limerick in 1976 and 1978 be excluded from the instant proceeding?

Answer - Yes. All evidence which was known or should have been known and/or reviewed by this Commission during the 1980 Limerick Investigation should be excluded from the present proceeding.

SUMMARY OF ARGUMENT

Staff submits that any evidence which is similar to that submitted to this Commission during the 1980 Limerick Investigation to explain and/or justify PECO's decisions to delay construction in 1976 and 1978 should be excluded from the record of the instant proceeding. In adopting ALJ Klovekorn's conclusions concerning PECO's imprudency in delaying Limerick construction in 1976 and 1978, the Commission also expressly adopted those portions of the ALJ's Initial Decision which were consistent with the Commission's conclusions. See ordering paragraph 6 of the Commission's August 27, 1982 order at I-8010034, 56 Pa. PUC 47, 71 (1982). A review of the excerpt of that Initial Decision contained in the appendix to this brief indicates that the parties introduced substantial amounts of testimony which are similar, if not identical to that which the Company is attempting to introduce into this proceeding. In reaching the conclusion of imprudency by PECO, ALJ Klovekorn and the Commission considered this evidence and found it to be unavailing in terms of excusing PECO's 1976 and 1978 construction deferral decisions. The reintroduction of this type of evidence by PECO into the instant proceeding is an essential part of the Company's attempt to relitigate the Commission's prior imprudency conclusions. Consistent with the Presiding Officer's ruling on the Staff's Motion in Limine, the resubmission of evidence previously considered by the Commission in 1982 must be prohibited.

The portions of the testimony identified in the Staff's Motion to Strike must therefore be stricken from the record of the instant proceeding.

ARGUMENT

I. ANY EVIDENCE ABOUT PECO'S 1976 AND 1978 DECISIONS TO DELAY CONSTRUCTION OF LIMERICK WHICH WAS KNOWN OR SHOULD HAVE BEEN KNOWN AND SUBMITTED TO THIS COMMISSION DURING ITS 1980 INVESTIGATION SHOULD BE EXCLUDED FROM THE RECORD OF THE INSTANT PROCEEDING.

Staff submits that any evidence which was submitted or should have been submitted to this Commission during the 1980 Limerick Investigation to explain and/or justify PECO's decisions to delay construction in 1976 and 1978 should be excluded from the record of the instant proceeding. The Commission Order, entered August 27, 1982, and the Initial Decision of the Administrative Law Judge Klovekorn, dated March 26, 1982, at Docket No. I-80100341 each review the evidence and issues surrounding PECO's 1976 and 1978 delay decisions. Re Limerick Nuclear Generating Station, 56 Pa. PUC 47, 56-61. Initial Decision, pp. 15-55. A copy of an excerpt of the Initial Decision, pp. 15-55 is attached and marked Appendix 1. A careful reading of the Commission Order and Initial Decision reveals lengthy discussions about record evidence which demonstrated that PECO delayed construction in 1976 and 1978 (1) without proper consideration of the ratepayers' interests, (2) to bring the units on line at a time when growth forecasts indicated that they were needed, (3) to avoid an excess capacity adjustment and (4) to remedy financial problems which PECO was experiencing. Id. Staff suggests that the evidence now offered by PECO should be evaluated using these four previously litigated subjects as guidelines.

A. ALJ Klovekorn's Initial Decision, Adopted By The Commission In Its Limerick Investigation Order, Considered Evidence Similar To That Now Offered By The Company In Concluding That PECO Was Unreasonable Or Imprudent In Its Construction Deferral Decisions.

In adopting ALJ Klovekorn's conclusion concerning PECO's imprudency in delaying Limerick construction in 1976 and 1978, the Commission also expressly adopted the portions of the ALJ's initial decision which were consistent with the Commission's conclusions. See ordering paragraph 6 of the Commission's August 27, 1982 order at I-8010034, 56 Pa. PUC 47, 71 (1982). A review of the excerpt of that Initial Decision contained in the appendix to this brief indicates that the parties introduced substantial amounts of testimony which are similar, if not identical to that which the Company is attempting to introduce in this proceeding. This attempted reintroduction of evidence that both ALJ Klovekorn and the Commission considered but found unconvincing or unimpressive in reaching their conclusion of imprudence by PECO must be prohibited.

The evidence of this type considered by the Commission and ALJ Klovekorn in 1982 is startlingly similar to that which the Company is now attempting to introduce into this proceeding. Indeed several of PECO's witnesses incorporate either by reference or as exhibits to their present testimony portions of their prior Limerick Investigation testimony. See Statements of Company

witnesses Boyer and Paquette. Moreover several of the outside consultant witnesses presented by the Company in the present case also testified for the Company in the 1980 Limerick Investigation (PECO witnesses Hieronymous and Perl). The introduction of this testimony is entirely consistent with the Company's intention to relitigate the prudency of its 1976 and 1978 construction deferral decisions. The present introduction of "new" testimony by these and other witnesses can only be for the purpose of using hindsight to resurrect arguments which were impliedly if not expressly rejected by ALJ Klovekorn and the Commission (i.e. Company acted reasonably under circumstances operative at time of decisions: Company could not finance construction in period so deferral inevitable: Company appropriately considered ratepayer interests at time of decisions: Company's judgments in these matters cannot be challenged by Commission.) A brief review of the prior testimony considered by ALJ Klovekorn and the Commission, as extensively detailed in the excerpt of the Initial Decision contained in the appendix to this brief, demonstrates the remarkable congruence between the Company's litigation efforts in the Limerick Investigation and in the present case.

1. The 1976 Extension.

The 1976 extension decision is extensively discussed in pages 35 to 39 of the Initial Decision. ALJ Klovekorn recites

the Company's evidence on its financial condition (p. 36, 37), its load forecasts at the time (p. 36) and its rate treatment by the Commission in the period (p. 36). Also detailed is the Company's testimony on its interpretations of the Commission's preferences concerning short term vs. long term rate impact (p. 38), and its fears of an excess capacity adjustment with an earlier completion date (p. 37). Included also are summaries of the responsive testimony of both the Trial Staff and the OCA asserting that the Company's 1976 extension decision was imprudent (p. 38-9).

2. The Company's financial ability to continue Limerick construction.

The issue of the Company's ability to finance continued construction of Limerick in the period 1976 to 1980 was extensively examined in the Limerick Investigation. The testimony of Staff witness Donald H. Muth on this issue is described on pages 39-42 of the Initial Decision. Mr. Muth testified that PECO would have been able to issue sufficient additional mortgage bonds in 1976-78 to eliminate the financial reasons for the postponement. The Company could have used some debt mixed with equity issues to finance the additional capital investment which could have had a beneficial effect on the Company's stock valuation (p. 39). Continued construction could have been financed by issuance of short term debt and additional common stock (p. 40-1). The issuance of additional first

mortgage bonds in the period is also described as a possible source of construction funds for the Company through the period (p. 41-2). PECO's criticisms of the Staff testimony are reproduced on pages 42-44 of the Initial Decision.

3. The 1978 Extension.

The evidence concerning the Company's decision to delay Limerick construction in 1978 is detailed on pages 44-46 of the Initial Decision. The Company testified that it did not in fact change the critical path of construction from 1978 through 1980 but that direct expenditures were reduced (p. 44). The Company's concerns with its load forecasting, levels of rate relief from the Commission, and continuing fear of an excess capacity adjustment are detailed (p. 45). The financial analysis used by the Company in making the deferral decision is also detailed (p. 45-6). The Trial Staff and OCA criticisms are also explained (p. 46).

As can be readily seen from the prior brief summary, much of the evidence the Company is attempting to introduce into this proceeding is an updated rehash of evidence previously considered and rejected by both ALJ Klovekorn and the Commission in the 1980 Limerick Investigation. Although it is entirely predictable that the Company will now advance this testimony as partially to "quantify" the results of its imprudence, the cold hard truth is that its real purpose is to rationalize with

hindsight the reasonableness of the Company's 1976 and 1978 construction deferral decisions. The strangely baited hook that the Company now offers: that its relitigation testimony somehow is now responsive to the issue of the quantification of the effects of its imprudency, must be rejected. The Company has completely failed to advance any reasons why testimony supporting the reasonableness of its prior actions (i.e. that financial conditions required it, that the circumstances required it, that all affected interests were examined) should again be considered in this proceeding. Consistent with the Presiding Officer's ruling on the Staff's Motion in Limine, all evidence going to these issues must be deleted from the present record.

B. Evidence Similar To That Considered By ALJ Klovekorn And The Commission In Reaching His Conclusion Should Not Be Admitted Into The Record Of The Instant Proceeding.

A review of the excerpt of the Initial Decision contained in the appendix to this brief indicates that the parties introduced substantial amounts of testimony which are similar, if not identical to that which the Company is attempting to introduce into this proceeding. The reintroduction of this type of evidence by PECO into the instant proceeding is an essential part of the Company's attempt to relitigate the Commission's prior imprudency conclusions. Consistent with the Presiding Officer's ruling on the Staff's Motion in Limine, the resubmission of evidence previously considered by the Commission in 1982 must be prohibited.

In the following material Staff is able to demonstrate the Company's consistent pattern of attempted relitigation by comparing the evidence noted in its Motion to Strike with the prior Commission Order and Initial Decision.

1. PECO Statement No. 1, Vincent S. Boyer

Mr. Boyer's testimony was presented on December 17, 1985. On p. 16, lines 21-28, he began to explain a general overview for the 1976 and 1978 delay decisions. On p. 17, lines 5-50, and p. 18 he related the construction schedule for Limerick I in 1975-1980 to PECO's financial planning. On p. 21, lines 17-50, pp. 22-23, lines 1-25, he testified about funding and construction problems in 1976-1980 which impacted on the Limerick completion dates. During cross-examination Mr. Boyer admitted that one of the purposes of his testimony was to supplement the record regarding the 1976 and 1978 delay decisions. (T. 1007, line 19 to T. 1008, line 17). Staff submits that simply because the company has attempted to lump the 1976-1980 period together does not make Mr. Boyer's testimony less objectionable. The admission on cross-examination is the key to understanding PECO's efforts to relitigate the 1976 and 1978 delay decisions and should be struck with the above noted portions of his statement.

Staff notes that Mr. Boyer testified in the previous Limerick Investigation. His prior testimony is succinctly summarized in the Commission Order, entered August 27, 1982. 56 Pa. PUC at 52-53. That portion of the Commission Order

is obviously distilled from ALJ Klovekorn's detailed discussion of the history of the Limerick project which is also based on Boyer's previous testimony. Initial Decision, pp. 15-29 (Appendix 1). Any comparison of those portions of Boyer's present testimony identified in the Motion to Strike to the Initial Decision and Commission Order demonstrates that the present statement is generally repetitious and has been rewritten only to further enhance the Company's actions. It is precisely this kind of repetition and relitigation which Staff's Motion in Limine is designed to avoid. Those portions of the testimony identified by Staff's Motion to Strike should be deleted from the record of the instant proceeding.

2. PECO Statement No. 3, Joseph F. Paquette, Jr.

Mr. Paquette's testimony was presented on December 20, 1985. The question framed on p. 31, lines 19-21, is the obvious start of testimony which violates the judge's ruling on Staff's Motion in Limine. In addition the remainder of p. 31, lines 22-27, violate Judge Matuschak's order regarding the 1974 delay. Mr. Paquette's statement on pp. 32 through 48, lines 1-4, including Appendices A and B and Tables 8, 12, 14-17, can only be construed as a major effort to relitigate the 1976 and 1978 delay decisions. All of the material should be excluded by operation of Staff's Motion in Limine. (N.T. 1374-1375).

In addition, Staff notes that Mr. Paquette previously testified in the 1980 Limerick Investigation. 56 Pa.

PUC at 55-58. Initial Decision, pp. 37, 44-46, 51-53 (Appendix 1). After reading those sections of the Commission's Order and Initial Decision noted above, it becomes clear that Mr. Paquette's prior testimony is the basis for the Commission's finding of imprudency for the 1976 and 1978 delay decisions. His present testimony has been written to demonstrate PECO's consideration of the benefits to the ratepayers' interests which was the subject of major criticism made by the Commission in evaluating the 1976 and 1978 delay decisions. Whatever additional evidence and arguments PECO now wishes to bring to the Commission's attention should have been presented in the 1980 Limerick Investigation. Those portions of Mr. Paquette's Statement identified in Staff's Motion to Strike fall within the purview of the Judge's ruling on the Motion in Limine and should be excluded. (N.T. 1370-1375).

3. PECO Statement No. 8, Basil P. Kononetz and Thomas J. Madden

The testimony of Mr. Kononetz and Mr. Madden was presented on December 19, 1985. Mr. Kononetz was the first of many expert witnesses called by PECO to supplement and bolster the testimony of Mr. Boyer and Mr. Paquette. Starting on p. 31 of his statement, Mr. Kononetz reviewed the history of the need for Limerick (as additional generating capacity) (pp. 31-37); PECO's examination of alternative, non-nuclear generating units (pp. 37-40), and the site selection process (pp. 40-46). All of these subjects were examined in the previous Limerick investigation (See 56 Pa.

PUC at 53-61. Initial Decision, pp. 15-30, Appendix 1.) and should be excluded from the record based on Judge Matuschak's order. (N.T. 1374-1375). On p. 258 the statement began a review of the Commission's conclusions in its final Order, entered August 27, 1982, regarding PECO's 1976 and 1978 construction delay decisions. An extensive analysis was performed of PECO's financial situation as it existed in the 1970s (pp. 258-271) and PECO's reevaluations of the need for Limerick during the 1970s (which included load forecasting, the economics of non-nuclear generating alternatives, and factors underlying the delay decisions) (pp. 271-284). Again, all of these subjects had been litigated previously at Docket No. I-80100341. 56 Pa. PUC at 50, 52-61. Initial Decision, pp. 15-21, 26-55 (Appendix 1). PECO knew or should have known all of the information presented by Mr. Kononetz and Mr. Madden during the first investigation. Those portions of the statement identified above should be stricken from the record. (N.T. 1370-1375).

Mr. Madden is another member of the staff of Theodore Barry and Associates called as an expert witness on PECO's behalf. Staff urges the Judge to read his introduction into the record. (N.T. 1196). It is a preview of another attempt by PECO to relitigate the 1980 investigation record. See 56 Pa. PUC at 50, 52-61. Initial Decision, pp. 15-21, 26-55 (Appendix 1). Cross-examination of Mr. Madden demonstrated that the purpose of his testimony was to present more information about PECO's financing of Limerick in the mid and late

1970's. His testimony upon cross-examination should be cross-referenced to the financial information in Statement No. 8 at pp. 258-271. (N.T. 1223-1256, l. 8). His testimony should be stricken. (N.T. 1374-1375).

4. PECO Statement No. 10, William A. Abrams

Mr. Abrams' testimony was presented on December 20, 1985. He is another expert witness called on PECO's behalf. Staff suggests that the ALJ review the stated purpose of Mr. Abram's testimony. (p. 4, ll. 12-25). It indicates that he will try to present more evidence about issues which were litigated in the 1980 Investigation. On p. 5, lines 10-13, p. 20, lines 25-27, pp. 21-30, line 10 and Exhibits 5-8 and Schedules 8-10 there are direct references to the 1976 and 1978 delay decisions from the viewpoint of the investor/financial community. Questions, as they relate to the Limerick construction, about the financial climate of the late 1970's, its effect upon PECO and PECO's financial condition were litigated in the 1980 Limerick investigation. 56 Pa. PUC 53-61. Initial Decision, pp. 35-55 (Appendix 1). There is no reason to include that material in this record. (N.T. 1374-1375). Generally all of Mr. Abram's testimony on cross-examination from T. 1418, line 16 through T. 1428, line 2, should be excluded. Each of the questions and answers were focused on PECO's financial problems in the late-1970s. (N.T. 1374-1375).

5. PECO Statement No. 11, Dr. Lewis J. Perl

Dr. Perl's testimony was presented on December 16, 1985. He appeared as another expert witness on PECO's behalf. Staff suggests that the ALJ review the purpose of Dr. Perl's testimony (p. 3, lines 33-37). It is clear from the outset that his statement will include information on issues which were litigated in the 1980 Limerick Investigation. 56 Pa. PUC at 50, 56-61. Initial Decision, pp. 35-55 (Appendix 1). Again, on p. 5, lines 22-30, he attempted to reach a conclusion contrary to the Commission's findings. 56 Pa. PUC at 61. On p. 9, lines 1-38, he presented another explanation to justify the alleged reasonableness of PECO's 1976 and 1978 delay decisions. He analzyed the economic impact of the 1976 and 1978 delay decisions on PECO's financial condition (p. 23, line 30 through p. 29, lines 1-5 and Schedule 7). Dr. Perl was a witness in the prior Limerick Investigation. PECO could have and did use him to try to justify the company position. Initial Decision, p. 8. PECO should not be permitted to challenge this Commission's prior finding using his testimony again.

On cross-examination Dr. Perl testified about the prudency of PECO's 1976 and 1978 delay decisions by using a comparison to other plants in construction at the same time. He reviewed his justification for the delays. (N.T. 882-883, 886, line 4, -891). Essentially, PECO is trying to use the benefits of hindsight to relitigate the

prudency of this Commission's prior finding. The evidence should be stricken. (N.T. 1374-1375).

6. PECO Statement No. 15, Dr. William H. Hieronymus

The testimony of Dr. Hieronymus was presented on December 16, 1985. He appeared as another expert witness on PECO's behalf. Again Staff suggests that the ALJ begin by reviewing the purposes of his testimony. (p. 3, lines 8-24, through p. 4, lines 1-18). There can be no doubt of PECO's intentions to relitigate the prudency of 1976 and 1978 delay decisions. On pages 37, line 19, through p. 38, line 6, Dr. Hieronymus disagreed with both the Commission and ALJ Klovekorn conclusion that PECO was motivated by fear of an excess capacity adjustment. 56 Pa. PUC 56-61. Initial Decision, pp. 36-55 (Appendix 1). Again PECO has tried to rationalize its delay decisions by comparing the Limerick construction schedule to other units in progress during the same time (pp. 57, line 18, through 67 and Exhibits WHH-4 through WHH-9). PECO is again trying to use hindsight to justify decisions made in 1976 and 1978. Not only is that view rejected by the reasonable man standard, but since the prudency issue was already evaluated in the 1980 Limerick Investigation, such evidence should be excluded from the instant record.

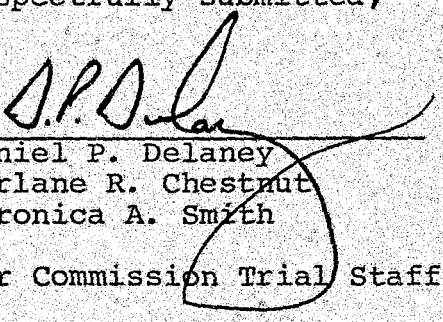
Cross-examination of Dr. Hieronymus should be cross-referenced to pp. 58-67 of his Statement and the related Exhibits and should also be excluded. Dr. Hieronymus

was also a witness in the prior Investigation. Initial Decision, p. 9. Much of his evidence, noted above, was or should have been presented to the Commission at that time. PECO must not be permitted to relitigate these issues again. (N.T. 1374-1375).

CONCLUSION

PECO had its opportunity to litigate the issues of the prudency of its 1976 and 1978 delay decisions during the 1980 Limerick Investigation at Docket No. I-80100341. After fully litigating the issue, this Commission made an adverse finding to the Company which was not disturbed upon appeal. Staff's Motion in Limine and Motion to Strike are designed to deny PECO the opportunity to once again rewrite history. For all of the reasons above stated Staff requests that its Motion to Strike be granted in toto.

Respectfully submitted,



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APPENDIX I

EXCERPT OF

INITIAL DECISION

OF

JOSEPH J. KLOVEKORN

ADMINISTRATIVE LAW JUDGE

Docket No. I-80100341

March 26, 1985

Pages 15-55

BEFORE THE

PENNSYLVANIA PUBLIC UTILITY COMMISSION

LIMERICK NUCLEAR GENERATING

STATION INVESTIGATION

I-80100341

INITIAL DECISION

OF

JOSEPH J. KLOVEKORN

Administrative Law Judge

March 26, 1982

Keystone claims that by 1974, the company should have realized that Limerick was not a viable project and that construction should have been halted at that point.

Keystone supports the City's conservation plan as a replacement for both Limerick units and criticizes PECO's present level of expenditures for conservation. It requests that conservation be implemented to replace at least Limerick Unit II immediately, and that construction of Unit I be suspended until further assessment of economic risks can be made.

Marvin I. Lewis

Mr. Lewis filed solely a reply brief. He is opposed to construction of Limerick claiming that further investment will dilute shareholder's equity and that Limerick's operations will not be fully insured, therefore subjecting shareholders to potential financial disaster. Mr. Lewis proposes that the costs of Limerick be written off over a 15 year period and that the company be directed to pursue an aggressive conservation plan.

HISTORY OF THE LIMERICK PROJECT

1967-1974

According to PECO witness Vincent Boyer, Senior Vice President, Nuclear Power, the company initially projected the need for the capacity additions, which were subsequently to be provided by Limerick, in 1967.

As Mr. Boyer explained (PECO Statement 1A, pp. 9-31), the 1960's and early 1970's were characterized by electrical demand exceeding forecasts, inadequate reserve margins, brownouts and blackouts, expressions of regulatory concern about adequate and reliable electric power

systems and power plant siting delays. Since electric utilities were, and are, mandated by statute to provide reliable service and thus overcome any electric power shortage by installing facilities which will be necessary to meet anticipated customer demand, he stated, the Limerick Generating Station was initiated to fulfill this obligation. The load/capacity forecasts, the PJM reserve obligations, and the social and regulatory pressures of the late 1960's prompted the initiation of the Limerick Generating Station.

In the decade 1960-1970, the number of residential customers served by PECO grew some 17 percent from about 913,000 to 1,070,000. Average annual kilowatt-hour consumption per residential customer in the 1960-1970 decade rose by over 77 percent from 3,373 kilowatt-hours per residential customer to 5,990 kilowatt-hours, and total residential consumption grew by over 108 percent. Commercial and industrial use of electricity in the area served by PECO rose 79 percent in the 1960-1970 decade. PECO anticipated substantial further growth in the 1970-1980 decade.

In the early and mid 1960's, 12 to 15 percent of the estimated annual peak was considered an adequate generation reserve. As a result of the Northeast blackout on November 9, 1965, the Pennsylvania Public Utility Commission and the Federal Power Commission exhorted the electric utilities to increase their generation capacity to meet anticipated load growth and future demands. On March 31, 1966, the utilities were told that immediate preparations should be made to increase installed capacity until a reserve of 20% above forecasted annual peak loads was reached. The utilities agreed to accept the Commissions' proposals and institute construction programs that would meet the stated goal.

The company's decision to build Limerick rested on its determination made in 1967 and 1968 that additional generating capacity would be required beginning in 1975 to meet its customers' needs. Mr. Boyer testified that the planning process which led to this decision was much the same in 1967 as it is today. He described this process as beginning with the forecast of future annual sales and peak demands. At least once a year the sales and peak demands are estimated for up to twenty years into the future. In addition, the reserves necessary to reliably supply these forecasted demands are calculated. The total generation required--peak load demand plus reserve requirements--is compared to the installed generation, which is calculated by deducting scheduled retirements and adding in commitments to new capacity. When the total forecasted generation requirement exceeds the projected supply, additional capacity is planned.

From 1961 through 1969, the company had experienced a 5.9% increase per year compounded in residential consumption of electricity, and a 6% increase in commercial and industrial use of electricity. The demand for electricity in fact outstripped available capacity during 1967, 1968, and 1969 which necessitated the voltage reductions and voluntary customer load curtailments experienced during those years.

Thus, when the company prepared its 1967 and 1968 forecasts of future capacity requirements, it faced pressures to add capacity both to meet its projected load growth and the increased reserve target of 20%. Although the company had planned new generating capacity to come into service between 1971 and 1974, the May 1968 forecast revealed that this new capacity would not be enough to meet the targeted 20% reserve margin beginning in 1975. The reserve requirement would have been 11.5% in

1975, 6.0% in 1976, and 0.9% in 1977 unless additional capacity was added in these years. The alternatives to adding new capacity in 1975 and 1977 were to plan for voltage reductions and/or service curtailments to customers, or to purchase power from other sources. PECO felt that the former option was unacceptable given the Company's obligation to its customers as a public utility and the pressures then being exerted by regulatory authorities. The purchase of power from other PJM companies similarly was unacceptable because those companies were facing increased demands on their own systems, possible delays in construction of new capacity to meet those demands, and current voltage reductions and load curtailments similar to those being experienced by the Company. Thus, Philadelphia Electric believed that it could not reasonably rely on the availability of excess power among PJM members in order to purchase electricity rather than add its own new capacity.

Once the need for addtional capacity in 1975 had been determined, the company decided that the new facility should be for base-load operation because the PECO system already had sufficient generation for cycling and peaking service. Peaking capacity of 260 megawatts recently had been added at Conowingo in 1964, an additional 880 megawatts was under construction at Muddy Run in 1969, and an additional 500 megawatts of combustion turbine capacity was also in the process of construction.

Once it was determined that base load generation was required, PECO's selection was limited to nuclear, oil or coal-fired plants (i.e., mine-mouth or local area). Hydroelectric generation was not an available alternative because the only locations capable of significant generation had been or were being fully developed, while natural gas did not present

a prudent alternative for economic reasons and due to the then-emerging uncertainties associated with future supply.

Of the fossil fuels, coal was preferred to oil generation in the mid-1960's for several reasons. First, throughout this century coal rather than oil had been the dominant fuel used by utilities. This historic emphasis on coal produced a highly-refined and efficient coal technology which perpetuated coal as the principal alternative. Furthermore, oil prices in the mid-1960's were slightly higher per million BTUs than coal prices, which made the oil-fired plants more costly to operate even though the capital costs of the plants were comparable. The company predicted that the disparity in prices between coal and oil would continue, in part because the demand for residential use of oil was increasing and, in part because the transport of coal, which constituted nearly half of its price, was becoming cheaper with the introduction of the unit train method of shipment. As a result of these factors, oil was the least preferred alternative for base load generation.

Mr. Boyer explained that with reference to coal-fired generation, the company explored the possibility of mine-mouth sites, but rejected this alternative because sites near large coal reserves within reasonable proximity to the company's service territory were already being developed. Moreover, transmission limitation would necessitate the construction of extensive additional transmission facilities to bring the power to the Company's service territory. More distant locations would have necessitated the construction of hundreds of miles of transmission lines with the concomitant costs and environmental problems incurred in obtaining rights-of-way. Accordingly, this alternative also was viewed as being uneconomic.

Given the inappropriateness of these various alternatives, PECO focused principally on the choice between nuclear and coal generation, with the latter located in the company's service territory.

A series of studies were performed in the 1965 to 1970 period which established that nuclear represented the more economic alternative. The most detailed of these, he testified, was conducted jointly in 1965 by Philadelphia Electric and the Public Service Electric and Gas Company prior to the commitment decisions for the Peach Bottom and Salem units. The specific purpose of this study was to recommend the type, location, and basis of ownership for new generating capacity to be installed jointly by the companies beginning in 1971. Coal and nuclear units of 900 MW net output were compared from the stand-point of reliability and system-wide production cost calculations. The fossil unit did not include the costs of coal and ash handling facilities or stack heights, which vary with the location of the plant. Moreover, the extensive environmental equipment, which after 1970 began to be required on local generating facilities, was not considered.

That report stated that a two-unit 1800 MW nuclear station would provide electricity at a total cost, excluding transmission, of 3.63 mills per kilowatt hour levelized over the 1971 - 1990 period. A fossil fuel plant would provide power at a cost of 4.71 mills per kilowatt hour over the same period. The capital costs of the nuclear units ranged from $206 to $230 million, depending upon the location of the facility, while the coal plant capital costs ranged from $176 to $205 million. The initially higher capital costs of the nuclear plant would be recaptured within three years because of the operating savings derived from the lower cost of nuclear fuel compared to coal. Over its

life, the nuclear plant would produce a levelized annual revenue savings to the ratepayers of $6,500,000 over the coal alternative.

In further analyzing the nuclear and fossil alternatives during the late 1960's, the company updated the 1965 analysis to reflect known changes in construction and fuel costs affecting a choice between nuclear and fossil fuel generation. By the end of the decade, as the company noted in its first Environmental Report submitted in support of its application for the Limerick construction permit, the analyses indicated that oil generation was the preferred fossil fuel alternative to nuclear power because no appropriate sulfur dioxide removal process was available to meet the emerging pollution requirements for coal generation. However, both fossil fuel options reflected higher fuel costs than the nuclear alternative, which continued to make nuclear generation the most economic of the three options.

Mr. Boyer explained that the preliminary objective of the site selection process was to locate new generating capacity near the area to be served, thereby minimizing transmission costs and improving overall system reliability by placing generating units close to the load center. In the late 1960's, 48% of the company's generating capacity was outside or on the periphery of the service area. Moreover, this capacity represented the newer base load generation of the company. To achieve more balance, the first criterion of the selection process was to locate additional capacity inside the service area.

Within the service territory, nuclear units were planned in the southern area for capacity additions in 1972 and 1973. The northern portion thus represented, in the company's view, the logical location for capacity additions to be provided in 1975 and 1977, especially given

the expending populations in Montgomery and Bucks counties. About nineteen sites were originally considered, but these were reduced to five sites in the desired northern service area: Sanatoga Crossing (Limerick Township), Washington Crossing (Bucks County), Buckingham (Bucks County), Tohican Creek (Bucks County) and Pine Forge (Berks County).

In 1969 PECO hired Gilbert Associates to perform a systematic appraisal of ten alternatives based on these five sites. The Gilbert analysis was supplemented by Company analyses of the same and additional factors affecting the desirability of these alternatives. These analyses were designed to compare site alternatives on the basis of costs and methods for the development of each site. Factors considered in the detailed evaluation included: topography, access to road and rail facilities, availability of water supply, land procurement costs, general geology and seismology, polulation density and proximity, meteorology, costs of transmission rights-of-way and facilities, and improvements to roads and bridges necessary for the transport of the reactor vessel and other super-heavy components to the site.

Among the principal advantages of the Limerick site was the existence of a 500 KV transmission line crossing the site. Because additional new transmission rights-of-way would not have to be purchased, the site presented the most economical of the five alternatives from this standpoint. Furthermore, the availability of the transmission line avoided the adverse environmental effects associated with the construction of lines over new rights-of-way which the other sites would have imposed.

In the same manner, the access route to the Limerick site from existing roads and railroad spurs was significantly shorter than at most

of the other sites considered, which produced corresponding cost savings and environmental benefits favoring the Limerick site. Land procurement cost comparisons he stated were also favorable to selection of the Limerick site.

Mr. Boyer also testified that the issue of the availability of water also was considered by the company in the 1969 study of possible sites. The analysis of the Sanatoga site in Limerick Township recognized that the water from the Schuylkill River would not supply the total requirements of the generating station. The study considered the possibility that a reliable water supply would depend upon fulfillment of plans by the Delaware River Basin Commisson (DRBC), to build dams on the Schuylkill upriver from the plant. To avoid reliance on the DRBC plans, the study also considered an alternative design which included the costs of an impounding reservoir. Even taking into account the costs of a reservoir, the Limerick site remained the most economical of acceptable sites according to total site costs because of the low transmission costs.

After the preliminary desirability of the Limerick site was determined, the Company again engaged Gilbert Associates to conduct a detailed evaluation of the site and plant design. This second 1969 study encompassed a more detailed review of the hydrology, water supply facilities, geology, meterology, land use and recreational activities in the area, population patterns, and manufacturing and commercial uses of the surrounding area. The study found, among other conclusions, that the Limerick topography was ideal, that the geology was favorable to this type of facility, that no major residential, commercial, or manufacturing complexes were closer than 1.5 miles to the site, that the site

was removed from heavily traveled highways, and that population density was not a bar to the site's employment.

According to Mr. Boyer, the company reached its decision to locate the generating station at Limerick only after thorough investigation of alternatives compared on the basis of economic, environmental, and social factors. The final selection of the Limerick site minimized the use of Pennsylvania land resources, avoided adverse environmental impacts associated with other sites, and minimized the capital investment in the project while enhancing overall system reliability and service to the company's customers.

Having determined that construction of a nuclear powered plant at Limerick was the best choice and location for a base load plant, the company next decided on a supplier of the nuclear steam supply system and an architect/engineer and constructor of the facility.

According to Mr. Boyer (PECO Statement 1A, pp. 22-23), General Electric, the manufacturer of the steam supply system for Peach Bottom Units 2 and 3, was selected as the vendor for the nuclear equipment and the turbine generator after evaluation of proposals from GE, Westinghouse and Babcock & Wilcox. The capital costs for the GE system were the lowest of the three proposals. Furthermore, the selection of GE coincided with the company's interest in duplicating the Peach Bottom design to the maximum extent possible to avoid unnecessary design and construction costs associated with new types of equipment. Thus, it was expected that the GE units would prove the most economic.

Similar considerations influenced the choice of Bechtel Corporation. Because Bechtel had already been hired as architect/engineer and constructor for Peach Bottom Units 2 and 3, the company asked Bechtel

to submit a proposal for these services for the generating station planned for 1975 and 1977. The company also considered a proposal from United Engineers which had designed and built the coal plants at Eddystone and Cromby and was the constructor for the nuclear units at Salem.

The company held several meetings in the spring of 1969 to review the proposals of each firm, which were comparable with respect to the fee to be charged. Based on Bechtel's overall experience in the nuclear field and its agreement to use the same engineers for both Peach Bottom and Limerick, the company awarded a contract to Bechtel in August 1969.

The Limerick project was developed and approved in concept by corporate management in the 1968 construction budget. Meetings were then held with the AEC, the Pennsylvania PUC and Department of Forests and Waters, the DRBC and various vendor and architect/engineering firms leading to a definition of the project with more complete cost estimates. With the award of the design-construction contract to Bechtel, the Preliminary Safety Analysis Report was prepared and submitted to the AEC in February 1969. In June 1969 a request for an Environmental Report was received from the AEC in conformance with the NEP Act of 1969.

The Limerick project was publicly announced in October 1969 at a meeting of all area officials in Collegeville. Presentations to describe the project in greater detail were then made to local and civic agencies and to congressional representatives. According to the company, public response was favorable. This conclusion was reached on the basis of meetings with various public officials. (Tr. 823)

The formal capital authorization for Limerick's construction was approved by corporate management in January 1971. It authorized the

construction of the two units at a total direct cost (exclusive of AFUDC) of $617 million. This projected plant cost represented a preliminary estimate by Bechtel, based on an analysis of actual construction costs experienced at Peach Bottom.

Prelicensing site work commenced in August 1970. Issuance of a construction permit was delayed, however, due to new environmental evaluations which the Atomic Energy Commission was required to make under the National Environmental Policy Act of 1969. Due to licensing delays, construction was suspended in January 1972. Construction resumed in March 1973 in anticipation that a license would be received in 1972. The construction permit was not ultimately issued until June 1974.

PECO contends that during this period it continuously evaluated its planned capacity additions to see if such additions were still warranted. Through 1974 these forecasts continued to support the need for Limerick capacity to serve anticipated future demand.

PECO stated that it also consistently reviewed and assessed its decision as to capacity type, both formally and informally, taking into consideration changing capital, fixed and fuel costs. Upon each occasion, the company came to the conclusion that nuclear generation was superior to any available alternative on a cost/benefit balance in both economic and environmental contexts.[5/] PECO also notes that during this time, this Commission granted PECO's application for finding of necessity associated with certain construction at Limerick. The Commission at A. 96108 (issued January 6, 1971) stated at p. 5:

5/ Summaries of these studies are contained in PECO Exhibit VSB-2, Section B.

> In this connection, the Commission is of the opinion that it is of paramount importance that applicant proceed forthwith with all such construction as it may lawfully undertake preliminary to the final AEC determination with respect to the nuclear facilities involved. Applicant is faced with the necessity of expending many millions of dollars to augment its electric generation within the next several years in order to provide adequate and reliable electric service to its patrons. The proposed Limerick Generating Station is one of several important power production facilities which applicant must complete on schedule in order to meet its ever-growing customer demands for electric service.

Similarly, the Atomic Energy Commission, Directorate of Licensing, stated on its November 1973 Final Environmental Statement, that expansion of PECO's plant capacity by 1979 appears to be prudent and necessary action to satisfy the growth requirements of its service area (PECO Exhibit VSB-2, Section D, p. 9-5).

Similarly, the Directorate evaluated various alternative sites and concluded that the Limerick site was the most acceptable of the alternatives considered (PECO Ex. VSB-3, Section D).

The Directorate of Licensing also evaluated other methods of electric generation and alternative sources of energy and found that neither hydroelectric generation nor natural gas were appropriate alternatives for PECO's future base-load generation requirements. Upon a cost-benefit analysis of nuclear, coal and oil, it was concluded that nuclear generation was the most economical (PECO Exhibit VSB-2, Section D).

The Atomic Safety and Licensing Board in a decision issued June 14, 1974, noted that coal and oil fired plants were inferior to nuclear plants from an environmental point of view and concluded that "satisfactory alternative methods are not available to [PECO] to serve

the demands on its system, and that at the present time, Limerick Generating Station offers the best alternative for supply such need based upon a cost-benefit analysis considering economics and environmental factors." The Board also found that selection of the Limerick site was acceptable and in compliance with NEPA. Finally, the Board concluded that PECO and its contractors were qualified to design and construct the Limerick Generating Station specifically noting in particular PECO's previous nuclear experience, "its care and preparation of the design and construction programs for Limerick" and the "close supervision and interest in Limerick by its top management."

The Atomic Safety and Licensing Appeal Board, in its review of the environmental assessment of the Limerick project, found that a nuclear plant at Limerick was preferable to all alternatives even if the generating capacity were limited in the event that a supplemental reservoir to provide water during the low flow periods of the Schuylkill and Delaware Rivers were not constructed.

The Appeal Board compared alternative types of generating capcity. It agreed that on both economic and environmental grounds the alternative of a coal-fired plant was properly rejected. In comparing oil versus nuclear the Appeal Board concluded that without considering the effect of possible water limitations, large nuclear and oil-fired plants can be expected to operate at approximately the same percentage of full-rate capacity. Given the same capacity factor, the Appeal Board noted that is was undisputed that a nuclear facility was more economical than an equivalent oil-fired plant. In assessing the water availability factor in the comparison of oil and nuclear, the Appeal Board concluded that water limitations would not have a materially different effect upon

the two types of plants. Moreover, the Appeal Board found that even if water limitation held capacity factors to 56% for both oil and nuclear, an economic advantage would still be obtained from nuclear.

Having traced the history of Limerick up to the grant of construction license in 1974, we now turn to consider criticisms of the Company's performance during this period.

Most of the criticism the Company's actions prior to 1974 has come from OCA. This criticism centers primarily on the deteriorating financial posture of the Company beginning in the late 1960's concomitant with a large construction program, including the Peach Bottom units, Croydon combustion turbines and Eddystone No. 3, as well as the Salem and Limerick units. According to OCA, the records shows that prior to 1974 PECO had vastly underestimated both the construction period and cost of its two incomplete nuclear units at Salem and Peach Bottom. Despite evidence of sharply escalating costs for nuclear units, the OCA claims that PECO continued its financial planning on out-of-date estimates (OCA M.B., p. V-4-10).

OCA also claims that PECO's 1965 study, made jointly with PSE&G, to look at the economics of Peach Bottom and Salem was poorly done. This study also used as the basis for PECO's initial and subsequent nuclear commitments; OCA claims that this study was properly not a justification for Limerick.

Although the Company states that updates were made to the 1965 analysis to reflect known changes in construction and fuel costs affecting a choice between nuclear and fossil fuel generation, these updates were not system-wide production costing studies. (OCA M.B., p. V-6)

The 1968 study made by the Company was not, according to the OCA, a full and detailed system-wide production costing analysis, but rather a plant-to-plant comparison of a nuclear unit versus a fossil unit (OCA Ex. No. 8, Table 1).

In summary, OCA claims that when PECO approved Limerick in concept, no detailed formal study had been done to determine the economic consequences of the decision.

PECO, in response, notes that the assertions made by the OCA in brief are not based on any testimony by any witness in this proceeding. The company is correct. No expert has stated that, in light of the appropriate standard for prudent generation studies in the late sixties, the 1968 or 1971 evaluations were inadequate.

It should also be noted that in 1974 the AEC affirmed PECO's determination of Limerick's economics and necessity and that in 1971 this Commission made a similar ruling. PECO cannot be faulted because the computerized technology in generation planning was not available in the 1968-1974 period. The record here shows that PECO's actions in the 1968-1974 period were reasonable and its decision at that time to construct a nuclear unit at Limerick was a valid exercise of managerial discretion.

1974 Extension

As previously noted, the two units of Limerick were initially scheduled for completion in 1975 and 1977. Due to various delays,

especially in obtaining regulatory permit from the Atomic Energy Commission[6/], construction did not begin until summer of 1974. At that time the anticipated in-service dates were July 1979 and December 1980. In October 1974, PECO announced a delay in Limerick's construction schedules by two years, so that Unit I would come into commercial operation in April 1981 instead of July 1979 and the second unit in April 1982 instead of December 1980. (PECO Statement No. 9, p. 3).

As stated by Mr. Joseph F. Paquette, Jr., Vice President of Finance and Accounting, that decision was due to the adverse financial factors affecting PECO at that time. As background, Mr. Paquette noted that during the 1950's and 1960's, PECO's financial results improved steadily and its dividend was increased on a regular basis. In the late 1960's inflation accelerated as interest rates increased above 6%. While PECO's return on equity was approximately 12% in the period 1965-1967, it dropped to 9.4% in 1970. It remained in the range of 10%-11% for the next three years. PECO's pre-tax interest coverage ratio dropped from 5.1 times in 1968 to 2.6 times in 1970. It remained in the range of 2.7 to 2.9 times through 1973. Its mortgage coverage ratio declined from 5.8 times in 1965 to 2.4 times in 1973. PECO's stock dropped in price from $40.50 per share to $17.00 in 1973.

As a result, PECO's credit rating was lowered by Standard & Poor's from AAA to AA in 1968 and to A in 1974. Mr. Paquette stated that, in retrospect, 1974 was a turning point in PECO history. (PECO Statement No. 9, p. 5) Since the end of World War II, its electric

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6/ The construction permit was not received from the AEC until June 1974.

business had shown almost uninterrupted strong growth every year and in 1973 PECO's kilowatthour sales increased 7% with demand reaching an all time peak of 5,760 megawatts. However, late in 1973, the Arab oil embargo occurred which doubled the price of oil almost overnight. As 1974 progressed, its fuel adjustment charge increased substantially which, together with the recession that was then in progress, led to reductions in energy usuage. PECO's peak load for 1974 was 5,431 megawatts, a reduction of about 6% from 1973. That was the first time since the 1930's that it had seen a significant reduction in the peak load. Furthemore, kilowatthour sales decreased in 1974 by about 3% from the prior year's level.

In addition, PECO was placing into service about $500 million of new plant consisting of the two new Peach Bottom units, the Croydon combustion turbines and the Eddystone No. 3 oil-fired unit which would increase its electric rate base from $1.5 to $2.0 billion or 33%. When the units were placed into commercial operation, AFUDC terminated, thus decreasing PECO's earnings.

PECO filed for a three-part $136 million electric rate increase in January 1974. The first part ($24 million) was allowed by the Commission to go in effect on April 1st. The company had requested that a second step, amounting to $54 million, be allowed to go into effect on June 1, 1974 when Peach Bottom No. 2 was expected to go in service. The final part, amounting to $58 million, was not expected to become effective until the end of the nine-months suspension period which would have been January 1975.

In the spring of 1974 PECO predicted that its five-year construction expenditures would amount to $3.3 billion for the period 1974

through 1978 and that it would have to finance about $2-1/2 billion of that with new securities. While, Mr. Paquette stated, PECO had confidence that it could complete that program, when the year began, as the year progressed, a number of events occurred which raised increasingly compelling doubts about its ability to raise this amount of new capital. (PECO Statement No. 9, p. 6)

The first event was Consolidated Edison's omission of its dividend in April 1974 which significantly shook investors' confidence in the entire electric utility industry. As a result, the price of PE's stock dropped from over $19.00 per share to below $10.00, right after the Con Ed action, and then fluctuated between $10.00 and $12.00 a share for the rest of the year. In addition, AA utility bond interest rates, instead of decreasing, rose significantly from about 8% to 11% by October.

In addition, the second step of its rate increase was not allowed to go into effect in June. In fact, the Commission took no action prior to the end of the maximum suspension period (January 1, 1975), so that all of the remaining increase ($112 million) became effective by law subject to refund. This was later reduced by $31 million when the final order was issued on March 25, 1975, requiring retroactive refunds.

PECO had planned to sell $100 million of common stock in the fall of 1974. However, in late summer the price of its stock was still below $11.00, or just above 50% of book value. An issue at that price would have caused prohibitive dilution to shareholders' equity. Furthermore, this issue was cancelled.

In addition, because of the declining earnings of the company and the significant rise in interest rates, its interest coverage ratio

dropped below 2.0 times and it had no further ability to issue mortgage bonds under the earnings coverage test, after selling an issue of bonds in October 1974. In November 1974, a $65 million bond issue matured which enabled the company to sell that amount of bonds in April 1975.

With PECO's financial condition already deteriorated, its sales decreasing, its costs increasing, with very little prospect for immediate rate relief, and with no ability to raise equity or mortgage debt capital, the company had decided to cut back on its near-term construction expenditures to meet the financial conditions that existed. According to Mr. Paquette, the obvious way to do this of course was to reduce spending at Limerick since that project represented the major portion of PECO's construction budget. (PECO Statement No. 9, p. 7).

The Limerick delay announced in the fall of 1974 and other changes enabled PECO to reduce its five-year spending by about $600 million and lowered its financial needs accordingly. At the time of the delay some $223 million, exclusive of AFUDC had been spent on Limerick (PECO Statement No. 1B, p. 6)

Mr. Paquette stated that PECO's primary objective was to adjust its financing needs in the immediate years ahead. It was too late to make a material change in financing requirements for 1974, but it was able to make significant reductions for the years 1975, 1976 and 1977. PECO reduced its outside financing needs for constuction by $154 million or 38% in 1975, by $174 million (38%) in 1976 and by $129 million (26%) in 1977 (PECO Statement No. 9, Table B).

According to PECO, its efforts to reduce financing needs proved to be correct since conditions did not improve in 1975. In 1975 PECO raised about $284 million for its construction program. It sold

over 10.8 million shares of common stock in 1975 at an average price of $12.31 per share. This increased the number of shares outstanding by 20% in just one year.

No party disputes that these events occurred. The OCA notes, however, that the company should have been aware then of the quagmire of direct construction cost escalations and in-service delays experienced by PECO at its other principal construction sites. (OCA M.B., p. V-11). The cost of this delay has been estimated at $36.6 million by the company. (PECO Statement 1B, pp. 6-7)[7/] and $372 million by the OCA.[8/]

Trial Staff argues that PECO should have either cancelled the units at this time or built the plant as quickly as possible. Instead, it criticizes the company for choosing the worst possible path-not cancelling before the bulk of construction was begun, but not pressing forward to get the plant finished in light of optimistic economic forecasts for 1976-1978. (OCA Ex. 23, Tr-1, 9; T.S. M.B. pp. 8-9).

1976 Extension

In 1976 PECO announced a further delay in the commercial operation of Limerick. Unit I was now to start in April 1983 and Unit II

7/ This is the additional carry-charge which would be experienced on the existing investment as the result of the deferral. It neglects, however, to reflect inflation in the costs of construction due to the delay.

8/ This is arrived at by comparing the July 1972 PECO estimates of total direct Limerick cost ($923 million) with the October 1974 estimate of $1.295 billion (OCA Ex. 1, IR 2, 1-3). This rough approximation cannot be relied on, since, of course, it reflects all post-July 1972 inflation, not just that portion related to the delay.

in April 1985. According to PECO, this rescheduling was made primarily to match growth in capacity additions with a new lower load forecast which was made in the spring of 1976. According to the company Witness Paquette, the rescheduling was desirable from a financial standpoint. The company had not been able to improve its financial performance to a satisfactory level and, therefore, any lightening of the construction program enabled it to reduce the financing burden that it was facing.

During 1974 and 1975, PECO's return on common equity was in the range of 8.9% to 9.4%, its SEC interest coverage decreased further to 2.3-2.4 times and the price of its stock remained in the area of $10 to $15 per share, which was only 50% to 70% of book value. Also, in 1976, Standard & Poor's reduced its bond rating again, this time to A-.

In the summer of 1975 PECO's electric peak load was 5,530 megawatts, again below the 1973 record. This gave PECO further indications that energy conservation was having a significant effect and that it could expect a permanent adjustment in customers' usage of energy. Therefore, at that time the company changed its forecasted growth rate from its pre-1974 level of 7% per year down to 5%. The effect of this reduced growth rate was to lower its estimated 1980 peak load by almost 1,000 megawatts. This meant that it could reduce its capacity accordingly. Therefore, it delayed the Limerick units by two years, which lowered its projected capacity by 1,055 megawatts in the years 1981 to 1984 inclusive.

PECO had filed for another rate increase in November 1975 for a total of $95 million, or 10%. It requested $47 million to go into effect on January 19, 1976 on an interim basis, but the Commission allowed only $24 million of the increase, a 2.5% increase, to go into

effect in February 1976. Another $23 million increase became effective in August of that year on an interim basis.

In the spring of 1976, PECO lowered its five-year construction program by about $750 million. On average, PECO was able to reduce its outside financings in those years by about $60 million per year, or about 20%.

Mr. Paquette also testified that in evaluating the 1976 postponement, "it is also important to appreciate the context within which these decisions were being made". (PECO Statement No. 9, p. 10).

When growth forecasts began to level off and it became apparent that it would not need Limerick's capacity in 1981 and 1983, Mr. Paquette stated, it was entirely consistent with corporate and regulatory policy to slow down the construction of that plant in order to avoid bring it on line in advance of its need. This concern about excess capacity came to the surface in the company's 1975 and 1976 rate proceedings, when questions were raised by the Commonwealth of Pennsylvania concerning reserve margins and the possibility that the company then had "excess capacity" which should be eliminated from its rate base. Although the PUC rejected the Commonwealth's arguments in that case, it did indicate that the company would be required to justify its installed capacity in the next rate case. According to Mr. Paquette, in such an environment the company concluded that the public interest did not warrant a speedy completion of Limerick. Indeed, the company felt that there was some risk that if it brought on the Limerick units in 1981 and 1983, this Commission might exclude it from rate base with very dire financial consequences to the Company (PECO Statement No. 9, p. 11).

According to the testimony the company recognized that such a delay could result in a higher cost for Limerick, although the amount of this increase could not be accurately determined. PECO stated that balancing these factors, it was clear that rates would be greatly reduced in the short term from a postponement of Limerick since customers would not have to pickup the carrying costs for the plant in 1981 and 1983.

PECO believed, based on a review of Commission actions at that time, that the Commission's preference would be to have lower rates in the short term, even though that might result in some long term increases. During the proceeding, PECO estimated the cost of this delay at $68 million. (PECO Statement 1B, p. 7).

The OCA is highly critical of PECO's 1976 decision to slip Limerick's construction schedule, stating that it evidences a corporate attitude to react to load growth by building more and more capacity and not attempting to control such growth. (OCA M.B., p. V-15). It also criticized the company for failing to analyze what capacity would be needed if load growth continued to deescalate. It rejects the company's expressed concern about excess capacity. Under such circumstances, OCA maintains, the appropriate consideration, if not necessarily, would be whether it was reasonable, possible and responsible to stockholders and ratepayers to cancel one or both units. OCA notes that no analysis of this type was made. The only generation planning analysss during this period were plant-to-plant, coal versus nuclear, studies. Furthermore, OCA argues, PECO's load forecasts were fundamentally flawed in their methodological failure to capture the changing consumption patterns. In May of 1976, $284 million direct construction costs had been expended on Limerick. (OCA Ex. No. 6, IR-2, 8-12). The delay announced in 1976

added, according to the OCA, some $202 million to the direct cost of Limerick. (OCA Ex. No. 20, IR-2, 1-3).

Trial Staff was also highly critical of the 1976 delay. It estimated the cost of this postponement to be approximately $506 million (T.S. Ex. REN-1A, Sch. 2, p. 1). Trial Staff's witness Dr. Donald L. Birx, noted that PECO's originally stated reason for the delay was reduced load forecast. (T.S. Statement DLB-1, pp. 3-4). A press release issued at the time, however, also referred to financial constraints. (PECO Statement 11-B, App. A).

Trial Staff Witness Donald H. Muth testified, that according to the company, the 1976 delay reduced PECO's financing requirements by $56 million (1976), $44 million (1977) and $76 million (1978). (PECO Statement No. 9, Table C).

Mr. Muth concluded that PECO would have been able to issue sufficient additional mortgage bonds in 1976-1978 to eliminate the reason for this postponement. (T.S. Statement DHM-2, pp. 2-3). Although these debt issues would have increased rates by increasing the cost of debt, Trial Staff admits, this is true whenever any debt is issued at greater than the embedded cost. It should also be noted that long term bond rates were lower in 1976-1978 than in 1974-1975 (Tr. 509).

Mr. Muth, however, would have had the company using some debt mixed with equity issues to finance the additional capital investment. In 1977 and 1978, according to the witness, PECO passed up an unparalleled opportunity to issue more common stock at close to book value. In fact, he noted such an issuance would have been closer to book value than the stock has attained since 1974 (T.S. Statement DHM-2, pp. 4-5 and T.S. Ex. DHM-2A, Sched. 8). In 1978, when the proceeds/book ratio was 90.6%

(Sched. 8), PECO did not even make a stock issue. The 1.9 million shares issued during this time were only through the ongoing dividend reinvestment and employee stock ownership programs (Tr. 510). Trial Staff argues that PECO should have been eager to issue common stock in 1978 after observing conditions in 1977, during which the average proceeds/book ratio was 101.5% (T.S. Ex. DHM-2A, Sched. 8). The increase in equity ratio would also have tended to increase rates in R.I.D. 438 and R-79060865, thus further improving PECO's interest coverage. Trial Staff maintains that PECO could have financed the construction in a variety of ways. In 1976, PECO's mortgage coverage ratio was 2.5 times. If PECO had not reduced its 1976 construction expenditures by $56,000,000 and had financed these additions with first mortgage bonds, its mortgage coverage ratio would have only been reduced to 2.4 times. (T.S. Statement No. DHM-2, p. 4).

Trial Staff argues that PECO could also have financed the $56,000,000 of construction on an interim basis through short-term debt. PECO reduced its short-term debt by $100,728,000 during 1976 and there was only $7,226,000 of short-term debt outstanding on its balance sheet at December 31, 1976.

According to Trial Staff, PECO could also have issued additional common stock during 1976. Although its common stock was still selling below book value at an average price of $16.68 per share, this price was substantially higher than the 10,866,340 shares it issued in 1975 at $12.31 per share.

Trial Staff also argues that PECO could have financed the additional $44 million needed to maintain its construction schedule in 1977 through the issue of more common stock. However, this construction could also have been financed by first mortgage bonds or, on an interim

basis, with short-term debt. In 1977, PECO issued 5,317,952 shares of common stock at an average price of $19.54, or 101.5% of book value. If PECO had issued another 2,300,000 shares it would have had sufficient funds to cover the $44,000,000 of additional construction expenditures. Common stock issued in 1977 would have totaled 7,617,952 shares or substantially less than the 10,866,340 shares issued in 1975 (at $12.31 per share) or the 9,749,355 shares issued in 1980 (at $14.14 per share).

PECO's mortgage coverage ratio was 2.35 times in 1977. If PECO had issued an additional $44,000,000 of first mortgage bonds in 1977, its interest coverage would have been reduced to 2.28 times (assuming that the $56,000,000 of additional construction expenditures in 1976 had not been financed with mortgage bonds). The issuance of an additional $44,000,000 of first mortgage bonds in 1977 would therefore not have had a material effect on its interest coverage. Even if the 1976 and 1977 construction expenditures had both been financed with mortgage bonds, the mortgage coverage ratio would have only been reduced from 2.5 times to 2.2 times.

Trial Staff argues that PECO could also have financed the $44,000,000 of additional 1977 construction through short-term debt. PECO only increased its short-term debt by $7,649,000 in 1977, meaning there was only $14,875,000 of short-term debt outstanding on its balance sheet at December 31, 1977.

PECO could have financed its 1978 construction expenditures by issuing additional common stock. PECO had no public stock offering in 1978. The shares that it issued in 1978 were sold through its Dividend Reinvestment and Stock Purchase Plan, its Employee Stock Purchase Plan and its Tax Reduction Act Stock Ownership Plan. The stock issued through

these plans was sold at an average price of $17.46 or 90.6% of book value. If PECO had held a public sale of stock during the first quarter of 1978, its per share price would have been even greater than $17.46.

PECO's mortgage coverage ratio was 2.37 times in 1978. If PECO had issued an additional $76,000,000 of first mortgage bonds in 1978, its interest coverage would have been reduced to 2.26 times (assuming no additional mortgage bond issues in 1976 or 1977).

If the postponed 1976 and 1978 construction of $56,000,000 and $76,000,000, respectively, had been financed with mortgage bonds and the 1977 construction of $44,000,000 with common equity, the 1978 mortgage coverage ratio would have been 2.18 times.

Short-term debt outstanding at December 31, 1978, totaled only $16,129,000. This balance provided sufficient leeway for PECO to finance some or all of the $76,000,000 of 1978 postponed construction with short-term debt if it had chosen to do so.

PECO argues that Trial Staff's position is not supportable. First, it claims Trial Staff employs hindsight to construct a set of hypothetical financings allowed by circumstances about which the company could not have known when faced with the need to make its decision. Trial Staff is able to construct this hypothetical financing program because, as Trial Staff points out, long term bond rates were at a lower level between 1976 and 1978 than they were in 1976, because the rate of inflation decreased in the period 1976 through 1978, and because the value of PECO common stock increased between 1976 and 1978.

According to PECO, the second deficiency of Trial Staff's hypothetical financing program is that, even with the benefit of hindsight, it is impractical. Trial Staff insists that, while PECO common was still selling below book in 1976, the company could have sold $56 million of common to finance Limerick since the 1976 market price exceeded the 1975 market price. In addition, common stock sales of $44 million in 1977 and $76 million in 1978 were recommended. As an alternative, Trial Staff suggested that PECO could have issued $56 million in mortgage debt in 1976 because the company's coverage ratio was 2.5 times, that PECO could have issued $44 million in mortgage debt in 1977 with a coverage ratio of 2.35 times, or that PECO could have issued $76 million in 1978 because the company's mortgage ratio stood at 2.37 times. If sales of common stock or mortgage debt failed, Trial Staff suggests the use of short term debt "on an interim basis" to finance $56 million in 1976 and/or $44 million in 1977, and/or $76 million in 1978.

PECO maintains that Trial Staff's hypothetical financing program is not fiscally sound. If its suggestions were added to the amounts actually issued by the Company through the same period, PECO would have been left with an indenture coverage below 2.0 times in 1979, and further mortgage bond financing would have been precluded. (PECO Statement 11D, p. 5).

PECO claims that in the 1975 to 1979 period it could only have issued a total of about $30 to $40 million in additional mortgage bonds while maintaining a 2.0 times mortgage coverage ratio in 1979 (PECO Statement 11B, p. 6).

Trial Staff also hypothesized common stock offerings in 1976 ($56 million), 1977 ($44 million), and 1978 ($76 million), but PECO claims, ignored the cumulative effect of such offerings. If as Trial Staff suggested, PECO had issued an additional $176 million in common stock, the company would have been left with earnings of $1.70 per share in 1978, an amount insufficient to cover the company's common stock dividend. (PECO Statement 11D, p. 5).

Trial Staff's suggestion that PECO could have financed all or some of their 1976-78 requirements through short-term debt, PECO claims, ignores the fact that short term debt must be constantly refinanced. It also ignores the fact that use of large amounts of short term debt for immediate construction needs would sacrifice all of the financial flexibility inherent in short term debt reserves which are necessary to protect against capital market disruptions and unanticipated operating needs. (PECO Statement 11D, p. 5).

1978 Extension

In May 1978 PECO announced a decision to reschedule Units I and II from 1983-85 to 1985-87. PECO Witness Mr. Paquette testified that PECO did not in fact change the critical path of the construction schedule from 1978 through 1980, and that in those years PECO authorized and spent the additional dollars to maintain the 1983-85 service dates in the event that it became desirable to complete the units earlier than 1985-1987 (PECO Statement No. 9, p. 12; Tr. 495). The record shows, however, that PECO reduced its direct expenditures from 1978-1980 from the budgeted amount of $529 million to $479 million (OCA Exh. 23, Tr-1, 7). PECO explains, however, that it funded all major construction activities

required to maintain the earlier completion dates, but not activities of lesser importance (PECO R.B., p. 96, fn. 7).

The reasons for announcing a delay in 1978, according to PECO witness Paquette, were similar to those which were involved in the 1976 decision. In other words, by 1978 there were two more no-growth years. PECO's load forecasters lowered peak load estimates from 5% to 3% per year. In addition, PECO claims, the Commission permitted inadequate rate relief during this period. One important factor in this decision to postpone was apparently the recommendation of Administrative Law Judge Joseph Matuschak at R.I.D. 438 that an adjustment be made to PECO's rate base for "excess capacity." This was viewed as a message to the company not to optimize installed capacity but to minimize current costs and rates.

PECO, however, continued to preserve its options to maintain the earlier timetable due to the fact that escalating oil costs now made it appear that completion of Limerick at an early date might be advantageous to customers even if the capacity was not required, since the fuel cost savings resulting from Limerick's operations would more than offset the carrying costs of the plant (PECO Statement No. 9, p. 14).

Unlike the 1976 delay (Tr. 502), however, PECO this time performed an analysis to determine the level of short-term savings vs. long-term costs attributable to deferring completion of the plant. In 1978 PECO estimated that a one-year delay would reduce revenue requirements in the first year by $190 million. This would come about through a $350 million savings in base rates offset by higher operating expenses of about $160 million due to continued energy purchases. However, beginning in the second year and every year thereafter for the life of

the plant customers' bills would be approximately $47 million higher so that it would take approximately five years before the savings would be offset. No present value analysis was made (Tr. 502-503).

OCA points out, in response, that Judge Matuschak's decision in R.I.D. 438 came months after the decision to delay was announced. OCA also claims that the company failed to adequately analyze the economic and financial implications of the delay and the possible cancellation of at least one unit (OCA M.B., p. V-24-26).

Trial Staff estimates the cost of the 1978 delay to be $597 million (T.S. Ex. REN-1A, Sch. 2, p. 1).

1980 Schedule Extension

In 1980 PECO abandoned its option of maintaning the earlier 1983/1985 completion dates. This was made necessary when it became obvious that manpower availability and labor productivity in the installation of bulk commodities such as conduit and pipe were not meeting the target values. The manhours necessary to install the seismic design of pipe hangers and restraints turned out to be greater than estimated, and interferences introduced by these hangers to duct work and cable trays also required additional manhours to resolve. In addition, the NRC action items resulting from Three Mile Island were issued, adding additional manhours of job effort (PECO Statement 1B, p. 7).

Reasonableness of the Delays

Having discussed the various delays in the Limerick construction schedule, we now turn to the reasonableness of PECO management's various decisions to postpone the commercial operation dates of these units.

Initial consideration should be given to the standard of prudence against which these decisions should be measured. PECO argues (PECO M.B. pp. 296-299), that Trial Staff has actually ignored the legal standard establishing the requirements for a showing of management imprudence. PECO notes that the "prudent investment" theory is not new to the regulatory process. It was first articulated by Justice Brandeis nearly sixty years ago in Missouri ex. rel. Southwestern Bell Tel. Co. v. Missouri Public Service Commission, 262 U.S. 276, 67 L.Ed. 981 (1923). In defining the appropriate standard to be applied by regulatory agencies in their review of utility expenditures, Justice Brandeis stated as follows:

> The term prudent investment is not used in a critical sense. There should not be excluded from the finding of the base, investments which, under ordinary circumstances, would be deemed reasonable. The term is applied for the purpose of excluding what might be found to be dishonest or obviously wasteful or imprudent expenditures. Every investment may be assumed to have been made in the exercise of reasonable judgement, unless the contrary is shown. Southwestern Bell, supra (dissenting opinion), 262 U.S. at 289, n. 1. (Emphasis added).

An assessment of management's prudence is not properly premised upon hindsight. As stated by the Michigan Public Service Commission in Re Consumers Power Co., 14 P.U.R. 4th 1 (Mich. P.S.C. 1976):

> It has also become well established that in applying the prudent investment theory to particular management decisions, the commission must determine that there existed a reasonable need and basis for the utility to commit funds for the construction of utility plant in light of the circumstances which prevailed when the decisions were made and, further, that the expenditures were reasonably incurred. . . . [T]he Commission reviews these questions, not with hindsight, but based upon the circumstances that existed at the time those decisions were made. (At pp. 15-16). (Emphasis added.)

Accord, Wisconsin Telephone Co. v. Public Service Commission, 232 Wis. 274, 287 N.W. 122, 148 & 157 (1939).

According to PECO mere speculation as to potential cost savings will not support a finding of managerial imprudence. Re Consolidated Edison Co., 54 P.U.R. 3d 43, 103-114 (N.Y.P.S.C. 1964); Re Consolidated Edison Co., 96 P.U.R. NS 194 (N.Y.P.S.C. 1952). Nor will evidence that certain claimed expenditures are unusually high alone justify their disallowance. Boise Water Corp. v. Idaho Public Utility Commission, 578 P.2d 1089 (1978).

Further, it is not sufficient that such testimony simply question the wisdom of management's decision. As stated by the New York Public Service Commission in Re Consolidated Edison Company, 54 P.U.R. 3d 43, 112 (N.Y.P.S.C. 1964):

> A determination of prudence of imprudence calls for an inquiry into the reasonableness of management's judgment, i.e. whether there was a rational basis for it, but not an inquiry into its wisdom. In short, it is not for a commission to determine prudence by reference to what it would have done if it had been exercising the powers of management. (Emphasis added.)

Also, it is not sufficient that opponents to rate base inclusion of the claimed investment show that management could have made other decisions which would have had equal economic or other decisions which would have had equal economic or other benefit. As stated by the Supreme Judicial Court of Maine in Central Maine Power Company v. Public Utilities Commission, 405 A.2d 153, 178 (Me. 1979):

> Where, as here, the road chosen by management is arguably at least as economical as any alternative, and the benefit (i.e. cost) does not clearly appear to be 'excessive, or unwarranted, or incurred in bad faith,' management's judgment must be respected.

PECO argues that the Courts of this Commonwealth have applied these same principles as the legal standard which must be satisfied before a ratemaking disallowance may be justified on the basis of "management imprudence." Pennsylvania Power & Light Co. v. Public Service Commission, 128 Pa. Super. 195, 210, 216-17, 193 A. 427, 433-34 & 436-37 (1937); Pittsburgh v. Pa. P.U.C., 370 Pa. 305, 318 (1952); Pittsburgh v. Pa. P.U.C., 173 Pa. Super. 87, 92 (1953).

PECO concludes that an analysis of its various scheduling decisions relative to Limerick, demonstrates that, at the time and in the circumstances, its decisions were prudent. It claims that only by ignoring the circumstances surrounding each of its decisions and by using instead hindsight and strained comparision that one is able to argue otherwise.

The standard by which PECO seeks to have its actions measured appears to this administrative law judge to be inappropriate. In effect, the company is saying that as long as there is a rational basis for its action, any decision that it makes cannot be criticized. While that may have been the rule in the past, more recent decisions by regulatory agencies have held that:

> ...the company's conduct should be judged by asking whether the conduct was reasonable at the time, under all the circumstances, considering that the company had to solve its problems prospectively rather than in reliance on hindsight. In effect, our responsibility is to determine how reasonable people would have performed the tasks that confronted the company. Case 27123, Consolidated Edison Company of New York, Inc. (Opinion 79-1, issued January 16, 1979, pages 5-6). (N.Y.P.S.C.) See also, Case 27565, Niagara Mohawk Power Corp. (Opinion 80-25 issued June 24, 1980), Case 27869, Consolidated Edison Company of New York, Inc. (Opinion 82-2, issued January 21, 1982, pp. 11-14).

This standard of "reasonable care" rather than "rational basis" appears to be more appropriate here, primarily because it reflects the need to recognize the economic impact of delays in construction on the company's ratepayers. The rational basis standard might well be appropriate where one is dealing with a single routine item of plant which may cost several millions or the selection of one transmission line route over another. Certainly, this Commission should not take it upon itself to review every management decision. But where, as here, a company decision will have a substantial, if not overwhelming impact on rates for many years, this Commission must judge that action by some standard other than its rationality. PECO's conduct in delaying construction shall be judged on the basis of how reasonable people would have responded to the events of 1974-1978 and whether PECO's response was satisfactory in light of all those conditions and circumstances.

On this basis PECO's action in 1974 was reasonable by any standard. The oil embargo of late 1973 resulted in higher energy prices and recessionary economic conditions throughout the country. For the first just time since World War II, energy sales and peak loads decreased. In addition the market for utility securities was poor due to the omission of Consolidated Edison's dividend. Under these circumstance, the company's decision to slip its construction schedule by two years was a reasonable response to an extraordinary series of events.

By 1976, however, the reduced load and financial constraints experienced by the company two years earlier continued. PECO's decision in the Spring of 1976 to delay Limerick for another two years might well have been reasonable, had it been based on a thorough evaluation of

economic consequences, not only to it but also to its ratepayers. The record, however, indicates that no such thorough evaluation was made.

As Trial Staff and OCA noted, PECO witness Paquette did not recall any analysis of the long-term economic costs to customers of this delay (Tr. 502). Although an exact determination of this increased cost could not be made, some sort of analysis should have been done. Similarly no analysis of alternatives to Limerick was made, neither did the company analyze its capacity requirements if load growth continued to decline.

In 1978 PECO did analyze the effect of its schedule extension on ratepayers and computed that a one-year postponement would reduce revenue requirements by $190 million for the first year, but would increase bills by $47 million per year the second year and each year thereafter for the life of the plant. Whether this was a good bargain for ratepayers is subject to discussion.

Although there can be no doubt that these postponements were caused in large part by financial factors, Mr. Paquette has offered another insight into management thinking when he testified (PECO Statement No. 9, pp. 10-13):

> In evaluating the 1976 postponement based on capacity and financial factors, it is also important to appreciate the context within which these decisions were being made. A public utility such as Philadelphia Electric has a duty to provide service and to build the facilities which are necessary to do so. Conversely, it has been historically recognized that no utility should build additional facilities which will not be useful within a least a reasonable time following their completion. Based on such an historic regulatory concept, it was clearly the view of the Company that Limerick should not be completed well in advance of the need for it. Accordingly, when our growth forecasts began to level off and it became apparent that we would not need Limerick's capacity in 1981 and 1983, it was entirely consistent with corporate and regulatory policy to slow down the construction of that plant in order to

avoid bringing it on line in advance of its need. This policy appeared to be confirmed when in the rate proceedings of 1975 and 1976 questions were raised by the Commonwealth of Pennsylvania concerning reserve margins and the possiblity that the Company then had "excess capacity" which should be eliminated from its rate base. Although the PUC rejected the Commonwealth's arguments in that case, it did indicate that the Company would be required to justify its installed capacity in the next rate case. In such an environment the Company concluded that the public interest did not warrant a speedy completion of Limerick. Indeed the questions concerning the Company's "excess capacity" indicated that there weas certainly some risk that if the Company brought on the Limerick plant in 1981 and 1983, the Public Utility Commission might exclude it from rate base with very dire financial consequences to the Company.

Offsetting all of these factors dictating a delay in the Limerick construction schedule, there was, of course, recognition by the Company of the possibility that such a delay could result in a higher ultimate cost for the Limerick station. The amount of this increased cost could, of course, not be accurately determined on any of the postponement dates. However, there was little question that additional AFUDC would be accrued as a result of the postponement, and it was also clear that the maintenance of the construction staff for a longer period at the site would increase overhead costs.

Balancing these factors, it was clear that the cost to the customers would be greatly reduced in the short term from a postponement of Limerick since they would not have to pick up the carrying costs for the plant in 1981 and 1983 but would have these costs postponed for at least two years. In other words, the delay decision involved clear short-term benefits to customers offset by possible long-term burdens, although the exact amount of those long-term burdens could not be precisely determined at the time.

In evaluating this question, the Company was of the view that the Pennsylvania Commission's preference would be to have lower rates in the short term even though that might result in some increases long term. Our judgment in this respect was based on a review of Commission actions and orders at that time. For examples, the Commission had refused the Company's request in include some CWIP in rate base and to normalize additional deferred taxes. Each of these PUC actions produced lower rates in the short

term, but higher rates in the long term and delay of Limerick seemed to fit in with this concept.

Because of continuing high inflation and low earnings, we requested another increase of $119 million in August 1977. We requested that approximately $50 million be allowed as interim rate belief to permit recovery of the carrying charges on Salem #1 which went into service on July 1977. However, the PUC granted an interim increase of only $11.8 million in March 1978. The final order for this case was not issued until March 1979, 19 months after we filed, and it granted an additional $67 million increase retroactive to July 4, 1978.

In the decision of the ALJ in connection with this rate increase, theres was a recommendation that the Commission adjust rate base for "excess capacity". We viewed this as another "message" from the public sector directing us not to optimize the installed capacity of our generating facilities, but to minimize current costs and rates. The regulatory philosophy for constructing additional capacity and the preference of short-term cost savings over long-term cost increases discussed in connection with the 1976 delay were all present in causing the delay announcement which was made in 1978.

It appears therefore that PECO's decision to postpone construction was influenced in part by the fear of an excess capacity adjustment by the Commission in a subsequent rate case. Rather than run the risk of such a revenue loss, the company chose to delay construction while at the same time continuing to accrue AFUDC on this plant-costs that will eventually be borne by the ratepayers.

In the past this Commission has held that there should be some sharing of the risk associated with bringing large plants on line and the resultant excess capacity which typically results. See Pa. P.U.C. v. Pennsylvania Power Co., R-77110521; Pa. P.U.C. v. Philadelphia Electric Co., R-79060865. This risk should not be effectively placed entirely on the ratepayer by permitting a utility delay the commercial operation of

a plant until the optimal time, while still allowing the company to earn a return, albeit non-cash, on its investment during this interregnum.

In summary, it appears that the company's action in postponing Limerick in 1976 and 1978 was made without careful analysis of the impact of such delay on its ratepayers.

In addition, the record shows that a factor in these decisions was the potential impact of Limerick on the company's capacity and reserve margins[9/] and the adverse effect this would have on the company's rate allowances. Consumers should not be expected to pay for delay which results form a conscious management decision to protect its own interests without adequate weight being given to its ratepayers' interest.

Trial Staff, although arguing that some adjustment is warranted as a result of PECO's decisions to postpone Limerick in 1976 and 1978, recommends that no final decision on this subject be made by the Commission at this time for the following reasons:

(1) A prospective rate base adjustment is arguably not within the Commission's power when PECO has not yet claimed the plant in rate base.

(2) A prospective rate base or other adjustment such as a four year stoppage of AFDC would give the consumers no immediate benefits in terms of lower rates; such a decision at this time might well lead to a bond downrating or higher cost of debt or equity which would have a

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9/ If Limerick were in service in 1981, PECO would have a summer reserve margin of 66% (PECO Statement No. 9, p. 18).

short range negative impact both on PECO and its ratepayers. Trial Staff suggests that this issue should therefore be considered again and more fully at the time PECO seeks to include Limerick in rate base. (T.S.M.B. p. 11).

I agree with Trial Staff that any decision now would be advisory only. This Commission cannot bind the future Commission that must decide PECO's claim for rate base treatment of these plants when they become commercially operable. Furthermore, this proceeding is a fact-gathering one. For purposes here, it is sufficient to note that the decisions to postpone Limerick were, in part, the result of management's discretion as well as financial circumstances. In a subsequent proceeding consideration can be given to the extent to which these delays were caused by financial and other external constraints and the extent to which management's fear of Commission sanctions entered into these decisions. Such a proceeding would also be an appropriate forum to quantify the effects of these delays. Such a record does not exist at the present time.

MANAGEMENT OF THE LIMERICK CONSTRUCTION PROJECT

Having followed the progress of Limerick up to the present it might be appropriate to discuss the management of the project as detailed on this record.

As noted earlier Bechtel Power Corporation was selected as the architect/engineer and constructor for Limerick, and General Electric was selected to provide the steam generator. Following the selection of these companies, PECO assigned responsibility for planning, scheduling

Services Administration General Counsel Washington, DC 20405

January 9, 1986

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SECRETARY'S OFFICE
Public Utility Commission

Mr. Jerry Rich, Secretary
Pennsylvania Public Utility Commission
Room G-18, North Office Building
North & Commonwealth Avenue
Harrisburg, Pennsylvania 17120

Dear Mr. Rich:

Re: Pennsylvania Public Utility Commission, et al.
v.
Philadelphia Electric Company
Docket No. R-850152

Enclosed for filing with the Commission are three (3) copies of GSA's Answer to the Interrogatories and Requests for Production of Documents and Data of the Philadelphia Electric Company Set I, addressed to the General Services Administration.

Sincerely,

Mildred E.V. Pitts

MILDRED E.V. PITTS
Senior Trial Attorney
Information Resources & Utilities Division

Enclosures

cc: Honorable Joseph P. Matuschak
Administrative Law Judge
Pennsylvania Public Utility Commission

All Parties

DOCUMENT FOLDER

CERTIFICATE OF SERVICE

Re: Pennsylvania Public Utilities Commission, et al.
v.
Philadelphia Electric Company
Docket No. R-850152

I hereby certify that I am, this 8th day of January, 1986 serving either by special messenger or by first-class mail, the foregoing document, GSA's Answer to the Interrogatories and Requets for Production of Documents and Data of the Philadelphia Electric Company Set I, addressed to the General Services Administration upon the persons listed below:

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GSA'S ANSWER TO PECO'S INTERROGATORIES

SET I

Q.1. State the name, educational background and professional credentials of each person you expect to call as an expert witness in this proceeding.

A.1 Witness name: David E. Kelley
Educational background: A.B. in Pure Mathematics
M.S. in Applied Mathematics with minor in Economics
Various seminars on cost of capital, accounting, and other public utility regulatory issues

Professional credentials: Mr. Kelley has testified on cost of capital and other regulatory issues since 1981.

Witness name: Philip R. Winter
Educational background: B.S. and M.A. in Mathematics
Various seminars on cost of capital and other regulatory issues

Professional credentials: Mr. Winter is a Chartered Financial Analyst and has testified on cost of capital and other regulatory issues since 1980.

Q.2. State the subject matter on which each expected witness identified in response to Interrogatory 1, above, is expected to testify.

A.1. Mr. Kelley will testify on the appropriate adjustment to test year O&M expenses for the effects of inflation.

Mr. Winter will testify on PECO's cost of capital and capital structure.

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Q.3. For each expected witness identified in response to Interrogatory 1, above, provide:

(a) A listing of all prior proceedings in which the witness offered testimony or a report on, or related to, any of the subjects on which the witness is expected to testify. Include the date, location, party represented and docket number for each prior proceeding, and provide copies of all testimony or reports.

(b) Any study, article or other document authored or coauthored by such witness on any of the subjects on which the witness is expected to testify.

A.3. (a) PECO docket number R-850152 is the first case in which Mr. Kelley has testified on adjustment of O&M expenses for inflation.

All of Mr. Winter's cost of capital testimony has been submitted on behalf of the Federal Executive Agencies. Copies of the cost of capital testimony submitted by Mr. Winter in cases occurring in 1985 are attached. Copies of Mr. Winter's testimony submitted prior to 1985 have not been enclosed due to their voluminous nature, but are available for review at General Services Administration's Central Office in Washington D.C.. A listing of the cases in which Mr. Winter has submitted testimony follows:

Date	Utility Company	Commission	Docket #/ Case #
Sep. '80	P.S. Co. of Colorado	Colorado	1425
Feb. '81	Commonwealth Edison Co.	Illinois	80-0546
Apr. '81	Pacific Gas & Elec. Co.	California	601-53
May '81	San Diego Gas & Elec. Co.	California	59788
May '81	Texas Power & Lt. Co.	Texas	2780
Sep. '81	P.S. Co. of NM	FERC	FR81-187-000
Nov. '81	Baltimore G.&E. Co.	Maryland	7574
Jan. '82	Potomac Elec. Pwr. Co.	Maryland	7597
Apr. '82	Texas Pwr. & Lt. Co.	Texas	4321
Jul. '82	Potomac Elec. Pwr. Co.	D.C.	785
May '83	Philadelphia Elec. Co.	Pennsylvania	R-822291
Mar. '84	Baltimore G&E Co.	Maryland	7770
Mar. '84	Florida Pwr. & Lt. Co.	Florida	830465-F-I
Nov. '84	Pennsylvania Pwr. & Lt. Co.	Pennsylvania	R-842651
May '85	Bell Telephone Co of Pa.	Pennsylvania	2779
July '85	Oklahoma G. & Elec. Co.	Oklahoma	29450
Oct. '85	El Paso Elec. Co.	Texas	6350
Jan. '86	Philadelphia Elec. Co.	Pennsylvania	R-850152

(b) Mr. Kelley has not published articles, or authored other documents, on inflation adjustments to O&M expenses.

The following articles and documents were authored, or coauthored, by Mr. Winter. Copies of these documents are attached.

"Single-stage v. Multi-stage Discounted Cash Flow Analysis for Cost of Equity Determination"; Electric Ratemaking, Vol. 1, No. 5, Oct/Nov. 1982, pp. 27-29 (Coauthored with David E. Kelley).

"The Discounted Cash Flow Estimate of the Dividend Growth Rate Revisited", (Comment on previous Fortnightly article) Public Utilities Fortnightly, November 8, 1984, pp. 56, 57, (Coauthored with David E. Kelley).

"Risk Premiums Available on Electric Utility Stocks Compared with Premiums Available on Alternative Investments" (unpublished technical paper prepared in 1984).

"The Importance of Price Growth to DCF Determination of the Cost of Equity" (unpublished technical paper prepared in 1985).

Single-Stage vs Multi-stage Discounted Cash Flow Analysis for Cost of Equity Determination

by Philip R. Winter, Supervisory Operations Research Analyst,
and David E. Kelley, Operations Research Analyst
General Services Administration's Office of Public Utilities

Regulatory commissions that rely on the discounted cash flow (DCF) approach for estimation of a utility company's cost of equity frequently depend on the yield plus growth form of this model, i.e., D/P + g. Although return witnesses do, at times, include a non-constant growth equation in testimony, we infrequently see alternative DCF forms and then only as a subordinate approach.

As analysts responsible for utilizing a rate of return model that most closely approximates reality, we have found the non-constant growth, or multi-stage, DCF model to have specific advantages over the constant growth form in today's economic environment. Certainly the experience of electric utilities during the past 10-15 years during which dividend growth rates changed dramatically without concomitant price appreciation is not supportive of constant growth assumptions. Similarly, in light of the past direct relationship between dividend growth and inflation, current generally held expectations for gradually declining rates of inflation are not accurately reflected by the constant growth form.

Additional support for the non-constant growth model comes from institutional investors. A survey of these investors found that where DCF approaches were utilized, most were of the multi-stage form. This form was preferred because projection of a constant growth rate through infinity was considered "naive" when actual experience indicates growth does not continue at a constant rate forever.[1]

In the following paragraphs, we review general forms of the single and multi-stage DCF models, provide examples of multi-stage DCF techniques used in both the investment community and in rate of return testimony, and describe conditions under which use of a non-constant growth model is appropriate. In addition, we quantify differences in results from constant and non-constant growth models under varying growth assumptions.

Single-Stage and Multi-Stage DCF Equations

Myron Gordon, in his text "The Cost of Capital to a Public Utility,"[2] presents a general DCF model in both a finite investor horizon and infinite investor horizon form. He expresses the finite model as

$$P = \sum_{t=1}^{n} D_t/(1+k)^t + P_n/(1+k)^n$$

where P = stock price per share, D_t = the expected dividend per share during period t, k = the investor discount rate, and n = the number of periods. The infinite version, in which n approaches infinity, is expressed as

$$P = \sum_{t=1}^{n} D_t/(1+k)^t.$$

Only under the assumption that D_t grows at a constant rate through infinity (with the growth rate g less than k) does this later version reduce to the familiar yield plus growth form: k = D/P + g. Dr. Gordon does specifically recognize in this text, however, the possibility of investor expectations for non-constant growth and, in fact, presents a two-stage model as an example. The two-stage model shown has the form

$$P = \sum_{t=1}^{n} D(1+g_1)^t/(1+k)^t + \sum_{t=n+1}^{\infty} D(1+g_1)^n(1+g_2)^{t-n}/(1+k)^t$$

where n represents the number of periods (years) during which growth rate g_1, is expected, and dividend growth at rate g_2 is expected thereafter. DCF models with three or more stages may be formed in a similar manner.

The three distinct DCF forms presented above offer alternative methods of analysis to the technical rate of return witness. Theoretically, the DCF form, or model, chosen should approximate reality as closely as possible. Whether because of tradition or ease of use, current analysts place greatest emphasis on the constant growth, infinite investor holding period, form.

Conditions Under Which the Multi-Stage DCF Model is Appropriate

Dr. Eugene Brigham (University of Florida) is one of the few return witnesses we have seen make regular use of an alternative DCF model. In prefiled, 1980 testimony for the Texas Power and Light Company (Docket #3006), he concluded that necessary conditions for the constant growth expectations may not hold, and, therefore, estimated the cost of equity using both a constant and non-constant growth form. The three specific conditions he listed for constant growth expectations, in the $g = br$ context, were: (1) the percentage of earnings retained is expected to remain constant over time; (2) investors expect the company to sell no new common stock, or to sell it at book value; and (3) the future rate of return on book equity is expected to remain constant over time.

In more general terms, Drs. Fred Weston and Eugene Brigham, in their text entitled "Essentials of Managerial Finance," state that the non-constant growth form is applicable when "super normal" growth is expected over the near-term followed by a decline in the growth rate to the norm for the economy.[3] Certainly if evidence supports the existence of differences between near and long-term dividend growth expectations, use of a multi-stage DCF model should be investigated. Although Value Line, Duff and Phelps, and other investment firms regularly provide expectations for near-term growth, long-term forecasts are not widely available. We do believe that published growth forecasts represent the expectations of many investors. The question remains, however, whether these near-term forecasts also represent investor expectations over the intermediate and later stages of an infinite investment horizon.

Current Users of Multi-Stage DCF Techniques

In an effort to determine the investment community's views on use of the multi-stage (non-constant growth) DCF model, a number of major investment firms were contacted. Among these were Salomon Brothers; Bache Stewart Halsey Shields; Drexel Burnham Lambert; and Kidder, Peabody. All indicated that multi-stage DCF techniques were utilized by their firm. Although a three-stage model was the most frequently mentioned, a four-stage model was also in use.

Three-stage advocates typically estimated growth rates for each year of the near-term, or first-stage of the investment horizon. The uration of the initial stage was usually five years. Growth rates utilized over each year of the intermediate, or transition stage, were determined in a variety of ways. The analyst could, as for the first stage, estimate annual growth rates for each individual year. Alternatively, interpolation techniques could be applied to obtain rates of growth applicable to the period between the first and third, or final stage. Both linear and non-linear interpolation methods were mentioned. Duration of the second stage varied widely depending on the investment analyst and the company being analyzed. Transition periods ranging from two to fifteen years were found in one listing of data inputs. In the third, and final stage, the company was considered to have entered a "steady state." Constant growth was assumed throughout this period, with assumption about long-term GNP growth considered a predominate factor. Design of computer software, developed to support multi-stage DCF analysis, allowed the analyst broad flexibility in the choice of alternatives to be used.

Quantification of Differences Between Constant and Non-Constant Growth Forms Under Varying Growth Assumptions

A reasonable question to ask after reading the above is whether differences in the results from a non-constant versus constant growth model justifies the effort required to perform a multi-stage growth analysis. DCF practicioners are well aware that the present value of an expected dividend stream is mostly determined by near-term dividend expectations, and that the contribution of dividends expected in later years diminishes rapidly. Why bother then with growth estimates for the long-term? Although the individual analyst must judge the worth of the effort required, we can provide under varying growth assumptions examples of differences in results. For demonstration purposes, we will compare constant growth model results with those from a two-stage model. Since most widely available dividend (or earnings) forecasts are no more than 3-5 years into the future, we will establish a first stage of four years and the second stage will cover all years thereafter. The non-constant growth model will therefore have the form:

$$P = \sum_{t=1}^{4} D(1+g_1)^t/(1+k)^t + \sum_{t=5}^{\infty} D(1+g_1)^4(1+g_2)^{t-4}/(1+k)^t$$

We will further assume that the company's stock is currently selling at $22.00 per share and that the current dividend is $2.20 per share. If Value Line, for example, projects compound annual dividend growth over the next 3-5 years to average 7% for this company, and actual dividend growth during the most recent five-year period has been near the 7% figure, one may conclude that the 7% growth rate is appropriate for use in the constant growth model. This model would indicate a 17.7% investor required return on the company's equity (compound annual growth is assumed). Alternatively let's assume that further analysis shows the recent five-year growth rate was recorded in a period following a severe recession during which dividend growth was flat, and that the rate of inflation during this five-year period increased dramatically to record highs. Because of inflationary trends, dividends were increased to maintain the company's stock price and the payout ratio was increased to a level not normally maintained. Although the analysis supports the 7% growth rate over the near-term, continuation of that level is considered unlikely. Dividend growth is expected to decline gradually, beginning during the latter portion of the near-term, and average 3%-4% over the long-term. Substituting the same current price and dividend amount in the two-stage model with the 7% and 3.5% expectations for near and long-term growth assumptions, indicates a 15.1% investor required return.

The difference between the indicated return requirements from the two methods in this example is 260 basis points an amount that would have a considerable impact on revenue requirements. One may alternatively envision a situation in which a company has recently experienced subpar dividend growth because of temporary conditions and these conditions were expected to continue to suppress growth over the near-term. Beyond the near-term, however, growth rates were expected to rebound to levels comparable to the industry. In this situation if recent past or future near-term growth expectations were used in the constant growth model, investor return requirements would understate those actually required based on long-term factors.

Using the $22.00 current price and $2.20 current dividend in the two-stage model described above, return requirements based on near and long-term growth rates ranging from 2% to 7% are as shown in the table below. If growth rates of 2% to 7% are substituted in the constant growth model the indicated required returns are as shown in the top-left to lower-right diagonal of this table. Table contents indicate that if the long-term rate is held constant, a one percentage point increase in the short-term growth rate leads to a 30-40 basis point increase in return requirements. A percentage point increase in the long-term rate leads, however, to a 70-80 basis point increase in required return if short-term growth is held constant. As may be seen from this example, dividend growth beyond the initial four years may have considerable impact on the indicated returns.

Table 1

Indicated Investor Required Returns from Two-Stage DCF Model Using Near and Long-Term Growth Rates Between 2% and 7%

Growth Rates (%) Near-Term \ Long-Term	2	3	4	5	6	7
2	12.2	13.0	13.7	14.5	15.3	16.0
3	12.6	13.3	14.1	14.8	15.6	16.4
4	12.9	13.7	14.4	15.2	15.9	16.7
5	13.3	14.0	14.8	15.5	16.3	17.0
6	13.6	14.4	15.1	15.9	16.6	17.4
7	14.0	14.7	15.5	16.2	17.0	17.7

Summary and Conclusions

Although not widely encountered in rate case testimony, non-constant growth forms of the DCF model have been found preferred by institutional investors and are described as an acceptable approach to cost of capital determination in the well known work of Myron Gordon. As similarly stated by institutional investors surveyed, we considered it naive to believe that investors expect either recent growth rates, or near-term projections of future growth rates to continue indefinitely. Certainly investor experience during the past 10-15 years is not supportive of the constant growth form.

Use of constant growth in situations that may be modeled more accurately using non-constant growth may significantly impact findings as to the required return. In the sample calculation shown, use of a 7% near-term growth rate in the constant growth model, when the evidence supported a 3.5% rate after the near-term, led to overstatement of return requirements by 260 basis points. In general for a two-stage model, a percentage point increase in long-term growth expectations, without change in the growth expectations for an initial four-year period, resulted in a 70-80 basis point increase in the indicated return. On the other hand, a percentage point change in growth expectations during the initial four-year period, without change in long-term expectations, led to a 30-40 basis point change in the indicated return.

Footnotes

[1] David F. Hawkins and Walter J. Campbell, "Equity Valuation: Models Analysis and Implications," Financial Executives Research Foundation, 1978, p 31.

[2] Myron J. Gordon, "The Cost of Capital to a Public Utility," MSU Public Utility Studies, 1974.

[3] J. Fred Weston and Eugene F. Brigham, "Essentials of Managerial Finance," 5th Edition, Dryden Press, 1979, p 375.

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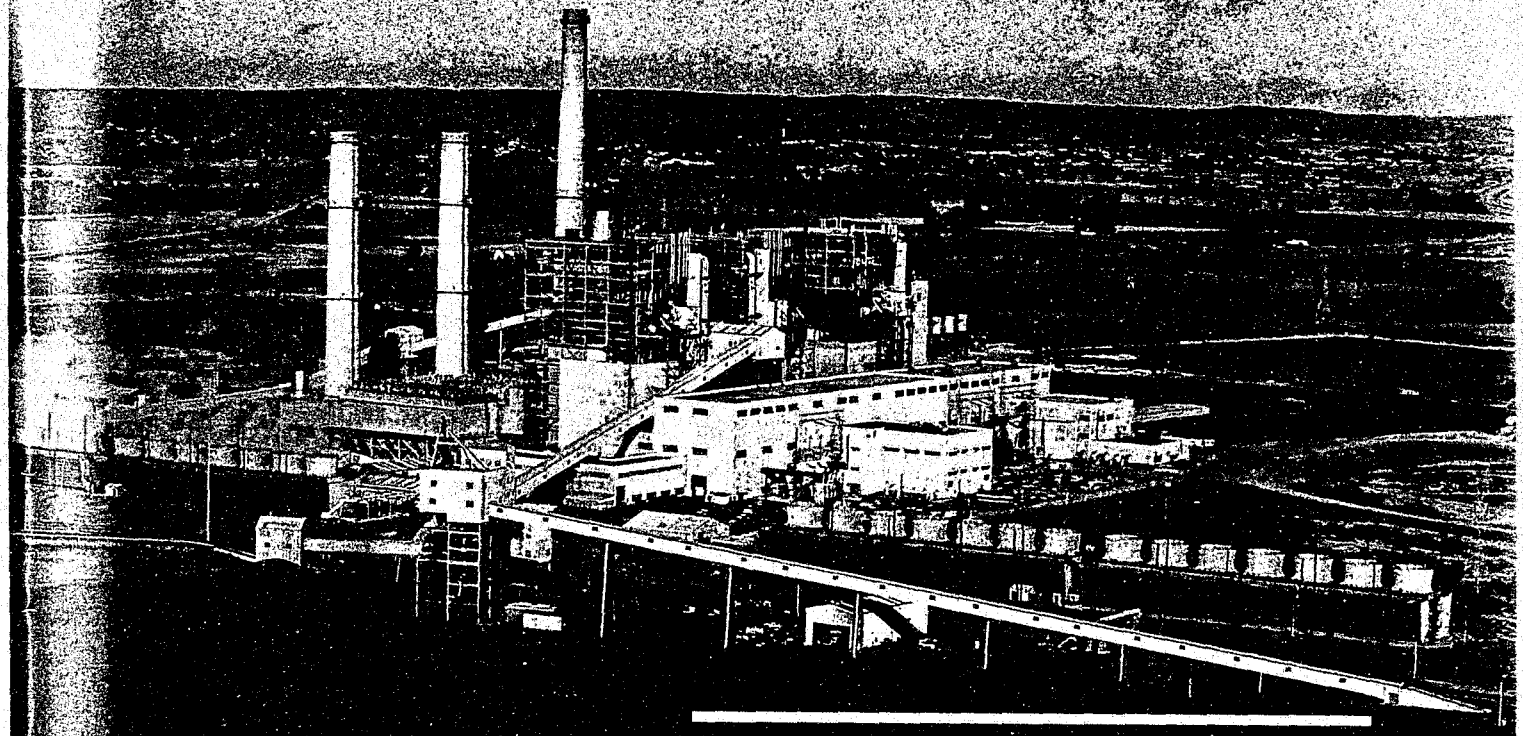

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WHAT OTHERS THINK

The Discounted Cash-flow Estimate of the Dividend Growth Rate Revisited

THE article by Eugene Rasmussen in the May 24, 1984, issue of PUBLIC UTILITIES FORTNIGHTLY, concerning the value of earnings-price ratios and return on book equity as boundaries for a utility company's cost of equity* is misleading. Our analysis reveals that the cost of equity may, in fact, fall outside the range established by the earnings-price ratio and the return on book equity. We have prepared the following comments to clarify the relationship among these three variables.

While Dr. Rasmussen's article appears to clarify the relationships among K, r, P/B, and E/P, imprecise definitions of these variables and ratios cloud the results. The above, and other, important variables in his article were defined as follows: K the discounted cash-flow (DCF) cost of equity; D, E, P, and B per share dividends, earnings, price, and book value, respectively; b the "expected" retention ratio; and r the "expected" earned rate of return. The algebra in his appendix shows more clearly the meaning he assigns to each variable. For example, (E−D)/B is shown to equal br in lines A-1 and A-3 and br is also shown to equal r−D/B in lines B-2 and B-3.

From the first equality (br = (E−D)/B), it can be shown that D = E−brB and from the second (br = r−D/B), we find D = rB(1−b). These findings are important because they relate D, which according to accepted DCF techniques is the *current* dividend amount or the dividend amount expected during the next twelve months, to b and r both of which are *expected* future values. By setting the two expressions for D equal to each other, we find rB(1−b) = E−brB, or r = E/B and (1−b)E = D.

With the above as a foundation, we can now focus on potential shortcomings in the use of r and E/P as boundaries for K. For Dr. Rasmussen's suggested use of earnings-price ratio and return on book equity to be of value, the practitioner must calculate or otherwise obtain values for E/P and r. The readily available values for E/P and r are, of course, their current values as indicated in recent accounting and market data. If current values are not used, the practitioner's judgement reenters the analysis — negating efforts toward reducing the judgemental aspects of determining K and g in the DCF equation. Dr. Rasmussen apparently advocates use of current values as shown in his Table 1. But use of *current* values for E/P and r contradicts the basic definitions on which the article's findings are dependent; i.e., r and b must be *expected* long-term values, as opposed to *current* spot values.

Since differences between current and expected values for b and r will affect the accuracy of E/P and r as boundaries on K, a remaining consideration is the potential magnitude of the inaccuracies. If the inaccuracies are small and unlikely, K may still reliably fall between E/P and r and the approach suggested by Dr. Rasmussen will be of value. The potential for inaccuracies may be determined by first assuming that the difference between the long-term expected value of br and the current internal growth rate — i.e. $(E_c-D_c/E_c)(E_c/B_c)$ — may be eliminated by an adjusting factor. Using the letter "A" to represent the adjusting factor, the expression for br becomes $A(E_c-D_c/E_c)(E_c/B_c) = A(E_c-D_c)/B_c$. The subscripts "c" indicate current, as opposed to future, value for earnings, book values, and dividends. Substituting this adjusted expression for br in the DCF equation for K provides $K = D_c/P_c + A(E_c-D_c)/B_c$. Using steps similar to those followed by Dr. Rasmussen, the relationship between K and E_c/P_c is $K = E_c/P_c + (E_c-D_c)(AP_c-B_c)/B_cP_c$. The "vs" term in this equation has been set to zero for purpose of simplification.

Now if we assume D_c is less than E_c, as is typical, the relationship between K and E_c/P_c is dependent on both the current market-to-book ratio and the difference between current and expected internal growth. If $P_c/B_c \geq 1.0$ and long-term future growth is expected to subside from current internal growth — i.e., $A<1$ — then AP_c-B_c may be positive, negative, or zero. Therefore, we cannot conclude with certainty, as Dr. Rasmussen apparently did in the case of $P_c/B_c \geq 1.0$, that K is greater than

*"Corralling the Discounted Cash-flow Estimate of the Dividend Growth Rate," by Eugene Rasmussen, PUBLIC UTILITIES FORTNIGHTLY, May 24, 1984, pp. 29-32.

E_c/P_c. Similar difficulties are faced in reaching a conclusion about the relationship between K and E_c/P_c when $P_c/B_c < 1.0$.

As for the use of r as a boundary on K, use of "A" as the adjusting factor leads to the following equation relating K to r: $K = Ar_c + D_c(B_c - AP_c)/B_cP_c$. This equation corresponds to equation B-4 in Dr. Rasmussen's appendix. Once again, we cannot conclude with certainty that K is less than r_c when the current market-to-book ratio is greater than one. The reverse may, in fact, occur if the value of "A" reverses the sign of $B_c - AP_c$. Realistic examples are relatively easy to construct in which K is 50 basis points, or more, outside the range formed by E/P and r.

Given the changes that have occurred in utility growth rates as documented by Dr. Rasmussen in his Table 2, the potential for the factor "A" to alter the otherwise expected relationship between E/P, r, and K appears to be real and significant as opposed to solely theoretical and negligible. In fact, in the regulated environment of utilities one might expect current market-to-book ratios below one and concomitant low internal growth rates to be accompanied by values for "A" that exceed one. If this characterization is correct, an agnostic view of the relationship between E/P, r, and K would be the rule instead of the exception.

— Philip R. Winter
— David E. Kelley
Operations Research Analysts
General Services Administration
Washington, D. C.

Eugene Rasmussen responds:

The Winter and Kelley commentary brews a pot of alphabet soup, but clarifies little. If earnings per share are altered by a constant percentage, the discounted cash-flow cost rate is only outside the range of the altered earnings price and earned rate of return ratios. For example, if $3 earnings are inflated by 15 per cent to $3.45, likewise the altered earnings-price ratio and earned rate of return rise 15 per cent. But also the numerical series one, 1.5, and two seems wrong if similarly altered to 2.5, two, and five, respectively. But really the question is: Does it make sense to use adjustment factor, "A," to alter actual data?

It seems, in the fundamental tradition of Graham, Dodd, and Cottle, that the wise investor will look for the proof in the pudding, the same position the more sophisticated "random walk" analysis established. "Random walk" simply says that, although variable, earnings per share are not haphazard but are persistent. This persistence is identified with multiple, complex causes that cannot be traced to specific factors through so-called security or technical analysis. Their impressionist security analysis amounts to the statement that, "In fact, in the regulated environment of utilities one might expect current market-to-book ratios below one and concomitant low internal growth rates to be accompanied by values for 'A' that exceed one."

The commentators' preference for analysts' forecasts has been expressed elsewhere.[1] But most studies have found little foresight in analysts' forecasts.[2] Another well-known investigator found actual growth estimates fit into the DCF formula.[3] Dr. Michael S. Rozeff, wrote that among one well-known group,

> [A]nalysts appear to provide forecasts that are as reasonable as others that are available at a similar low cost but may tend to err on the high side, at least at times, for particular groups of stocks such as electric utilities.[4]

Even analysts' forecasts do not justify any adjustment factor but a one. An accurate analyst is correct when hitting actual earnings 100 per cent of the time, thus one; an inaccurate analyst, who is never correct, should be disregarded. And most analysts may be too high sometimes; too low others; but ultimately an average ratio of predicted earnings to actual earnings of one, not some 1.15 times, tests the analysts' accuracy. Most utilities are infrequently analyzed by only a few analysts, producing an everchanging and wide-ranging set of estimates of unknown veracity.

What Winter and Kelley essentially pursue is the security analyst's El Dorado, the undervalued stock. The fundamental DCF formula:

$$P = D/(k-g)$$

produces the cost of capital only when the price of the stock equals the present value of the dividend stream, the right-hand side. As with the undervalued stock analysis, Winter and Kelley inflate the right-hand side, leaving the left-hand side as is. But what they abandon in the process is the market cost of common equity in search of what growth and earnings "ought" to be, rather than what actual experience suggests it might be. By the nature of the undervalued stock their expected return exceeds the market's cost of capital. And if a utility stock were overvalued, the prospect is for "A" to be below one. But how can anyone measure when the commentators' "A" is below one, anymore than when it is above one? Was there an "A" in the 1960s when returns and market-to-book ratios were high, but rate reductions were few and far between?

What "Corralling the Discounted Cash-flow Estimate of the Dividend Growth Rate" proposed was a dual DCF approach to testing the estimated growth rate. By using

[1] "Single-stage versus Multistage Discounted Cash-flow Analysis for Cost of Equity Determination," by Philip R. Winter and David E. Kelley, *Electric Rate Making*, October, November, 1982, pp. 27-29.

[2] "Empirical Studies of Capital Markets: A Survey," by Clive W. J. Granger, *Mathematical Methods in Investments and Finance*, North Holland, 1972, pp. 507, 508.

[3] *"The Cost of Capital to a Public Utility,"* by Myron J. Gordon, Michigan State University, 1974, p. 105.

[4] Prepared direct testimony of Michael S. Rozeff, Re United Telephone Co. of Iowa, RPU-83-39 and RPU-83-40, on behalf of the Office of the Consumer Advocate, January 23, 1984, p. 10.

RISK PREMIUMS AVAILABLE ON ELECTRIC UTILITY STOCKS COMPARED WITH PREMIUMS AVAILABLE ON ALTERNATIVE INVESTMENTS

By Philip R. Winter

Have investors in electric utility stocks been adequately compensated for the risks associated with these stocks? What risk premiums have been available to investors in these stocks? Have premiums available to electric utility investors compared favorably to those available on a diversified portfolio of common stocks? Both investors and utility commissions consider answers to the preceding questions as part of the input to investment and regulatory decisions.

Answers to the risk premium question as it pertains to a large, diversified portfolio of common stocks have been provided in the frequently cited works of Ibbotson and Sinquefield. Historically available risk premiums on long-term corporate and long-term U.S. government bonds are also quantified in these works.[1/] But where in this risk premium hierarchy do electric utility stocks fall?

The following paragraphs document results from applying the Ibbotson and Sinquefield method to electric utility stocks. Average premiums, based on annual returns, have been computed and the results are compared with those premiums found for common stocks in general. The effects of varying the investor holding period on available premiums are also discussed within the

context of the corresponding effects on other common stocks and corporate bonds.

The Method and Data Utilized to Calculate Risk Premiums

Monthly values for Moody's electric utility index were used to compute those returns available to investors in electric utility stocks. This index is derived by weighting the market price of each of twenty-four utility companies by the number of shares outstanding, then dividing the sum of these weighted prices by total adjusted shares outstanding. The adjustment to total shares outstanding is made to offset the effects of stock splits or stock dividends. Price and dividend data for the index were obtained for the period 1929 (the earliest year for which data are published) through 1982 for Moody's Public Utility Manual. Dividends were assumed to be paid quarterly with payments occurring in the second, fifth, eighth, and eleventh month of each year. Dividend reinvestment was assumed to occur at the price recorded for the month in which payment occurred. The equation used to calculate monthly returns was:

$$r_{m,t} = ((p_{m,t} + d_{m,t})/p_{m,t-1})) - 1,$$

where $r_{m,t}$ is the total return during the month t, $p_{m,t}$ is the value of the Moody's index at the end of month t, and $d_{m,t}$ is the estimated dividend received during month t. The returns calculated are pre-tax and pre-transaction cost returns. Annual returns were calculated by compounding monthly returns.

1/ Roger G. Ibbotson and Rex A. Sinquefield, "Stocks, Bonds, Bills, and Inflation: Year-by-Year Historical Returns (1926-1974)," Journal of Business 49, No. 1, (January 1976)

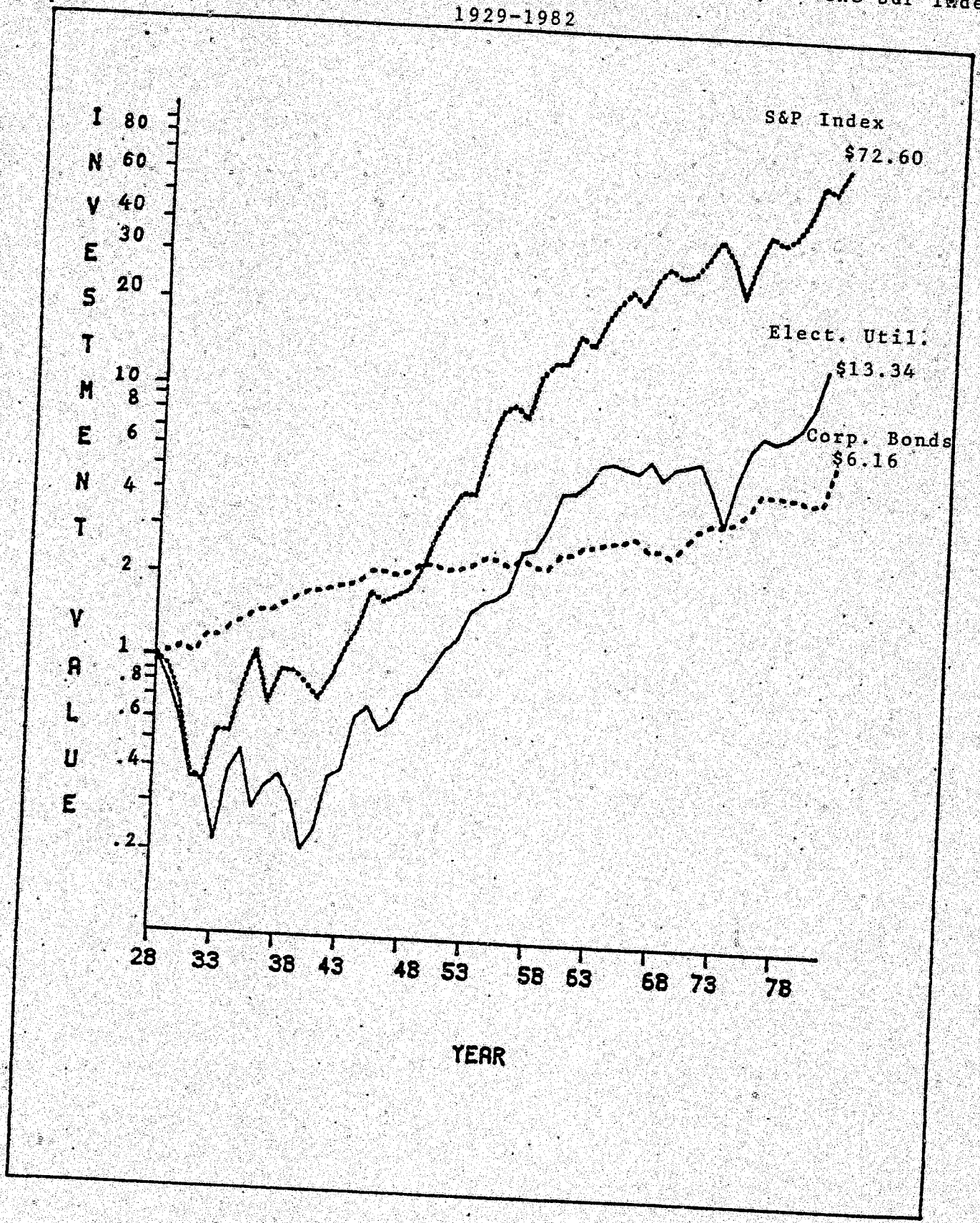
The previously referenced Ibbotson and Sinquefield studies (and subsequent updates) provided the source for monthly and annual return data on common stocks and long-term U.S. government and corporate bonds. These studies relied on Standard and Poor's Composite Index for calculation of common stock returns, data from the U.S. Government Bond File at the Center for Research in Security Prices for calculation of government bond returns, and various series on corporate bond prices and yields from Salomon Brothers for calculation of returns on corporate bonds.

Overview of Historically Available Returns to Investors in Electric Utilities

Before discussing specific risk premium findings, a review of Figure 1, below, provides an overview of the pattern of returns available to investors between 1929 and 1982. The wealth accumulated from a $1.00 investment in 1929 is shown in this figure for each year within the period. All dividends are assumed reinvested in the security (e.g., S&P Index, electric utility index) from which they are received. A logarithmic scale has been used for the vertical axis so that equal distances on this axis represent equal percentage changes in accumulated wealth. The plot for corporate bonds shows the lowest volatility in returns, and correspondingly the lowest total end-of-period wealth.

Wealth obtained from the electric utility investment is slightly more than double that available from corporate bonds ($13.34 vs. $6.16), but significantly more risk was associated with the utility returns. The jagged

1929-1982


INVESTMENT VALUE
80
60
40
30
20
10
8
6
4
2
1
.8
.6
.4
.2
28
33
38
43
48
53
58
63
68
73
78
YEAR
S&P Index
$72.60
Elect. Util.
$13.34
Corp. Bonds
$6.16

pattern of utility returns are indicative of the uncertainty associated with this investment and standout in contrast to the relative smooth curve depicting corporate bond returns. Although risk due to return variability would be relatively less severe if total returns on utility stocks remained above that available on corporate bonds, utility stocks do not satisfy this criterion. During both the 1974 recession and the period prior to 1958, cumulative wealth from the utility investment fell below that recorded for long-term corporate bonds. As an indication of the size of opportunity losses faced by utility investors, calendar year returns indicate that significant negative premiums, i.e., returns below that recorded on government bonds, may be recorded, some in excess of 40%. The largest comparative negative premium recorded for corporate bonds was slightly less than 10%.

When the point of comparison is changed from corporate bonds to the S&P Index, a much greater similarity to utility return patterns is found. The accumulated wealth patterns follow parallel paths during much of the 54-year period. Utility returns fell behind those recorded for the S&P Index during the late 1930's and early 40's and this gap was never closed. The gap widened during the 1960's and early 70's with the end-of-period wealth from the S&P investment closing at a level over five times that available from the electric utilities. As for potential losses, the probability of a reduction in accumulated wealth during any one calendar year appears to be about equal for these two indices. The largest negative premium (return below that of government bonds) during a calendar year was approximately 40% in both cases. More will be said about the specific distribution of annual returns in subsequent paragraphs.

Extending the investor holding period from one to ten years reduces the risk and return faced by the investor in any of the three categories of investment, e.g., S&P stocks, corporate bonds, utility stocks. Although average negative premiums available to utility investors with 10-year holding periods decreased to approximately one-quarter of the one year holding period value (.098 to .027), the probability of a negative premium over the holding period remained near the 25% level. Both corporate bonds and S&P stocks recorded greater declines than utility stocks in the probability of negative premiums and the average negative premium as the holding period was extended. Utilities did, however, experience a smaller decline in average positive premiums as the holding period was increased than either S&P stocks or corporate bonds.

Risk Premiums Historically Available on Electric Utility Stocks

Geometric and arithmetic mean returns for the three categories of securities addressed in this study are contained in Table 1. Of the two averages, the geometric mean return should be the better indicator of expected long-term average compound returns. The arithmetic mean return alternatively offers the better indicator of the return expected for any one calendar year. Consistent with findings discussed in preceding paragraphs, average annual returns for electric utilities have exceeded those on long-term U.S. government bonds and S&P Index returns have exceeded those on electric utilities.

Based on geometric mean returns, the average premium available between utility stocks and long-term government bonds was 1.5 percentage points (150 basis points). Similarly, S&P Index compound annual returns exceed those on electric utilities by 330 basis points. These and other risk premium findings for the S&P stocks, electric utilities, and long-term corporate bonds are summarized in Table 2. Standard deviations of the annual returns are also contained in this table as a measure of corresponding risk.

Risk/return relationships implied by Table 2 entries invite additional comment. Although the expected positive relationship between risks (as measured by the standard deviation of returns) and average returns is shown to exist between stocks and bonds, this relationship breaks down between S&P and utility indices. The standard deviation of returns for both these indices is near 22.5%, but as previously noted returns on utilities have not kept pace

Table 1

Average Total Annual Returns

1929-1982

Security/Index	Geometric Mean	Arithmetic Mean
S&P Index	8.3%	10.5%
Electric Utility Index	4.9	7.5
L.T. Gov't Bonds	3.4	3.7

Table 2

Historically Available Risk Premiums

and Variability of the Premiums

1929-1982

Security/Index	Based on: Geometric Mean	Arithmetic Mean	Standard Deviation
S&P Stocks - L.T. Govt's	4.8%	6.8%	22.47%
Electric Util. - L.T. Govt's	1.5%	3.9%	22.86%
L.T. Corp. Bonds - L.T. Govt's	.7%	.7%	3.27%

with those on the S&P Index. A more detailed analysis of returns over differing time periods reveals that the main source of imbalance between risk and return on utility stocks is the period prior to the early 1940's. Subsequent to this period, the standard deviation of annual returns on the S&P Index has exceeded that for utilities (19% vs. 17%) and the available premium of 100 to 200 basis points (depending on whether geometric or arithmetic means are employed) has the expected "plus" sign. The post 1942 findings also support the existence of a linear relationship between risk and return, a relationship that is consistent with security market line theory. A plot of the risk/return coordinates found for utility stocks for this period, within the axes containing the two sets of coordinates found for corporate bonds and S&P stocks, reveals these points to be collinear.

Distribution of Premiums by Investor Holding Period

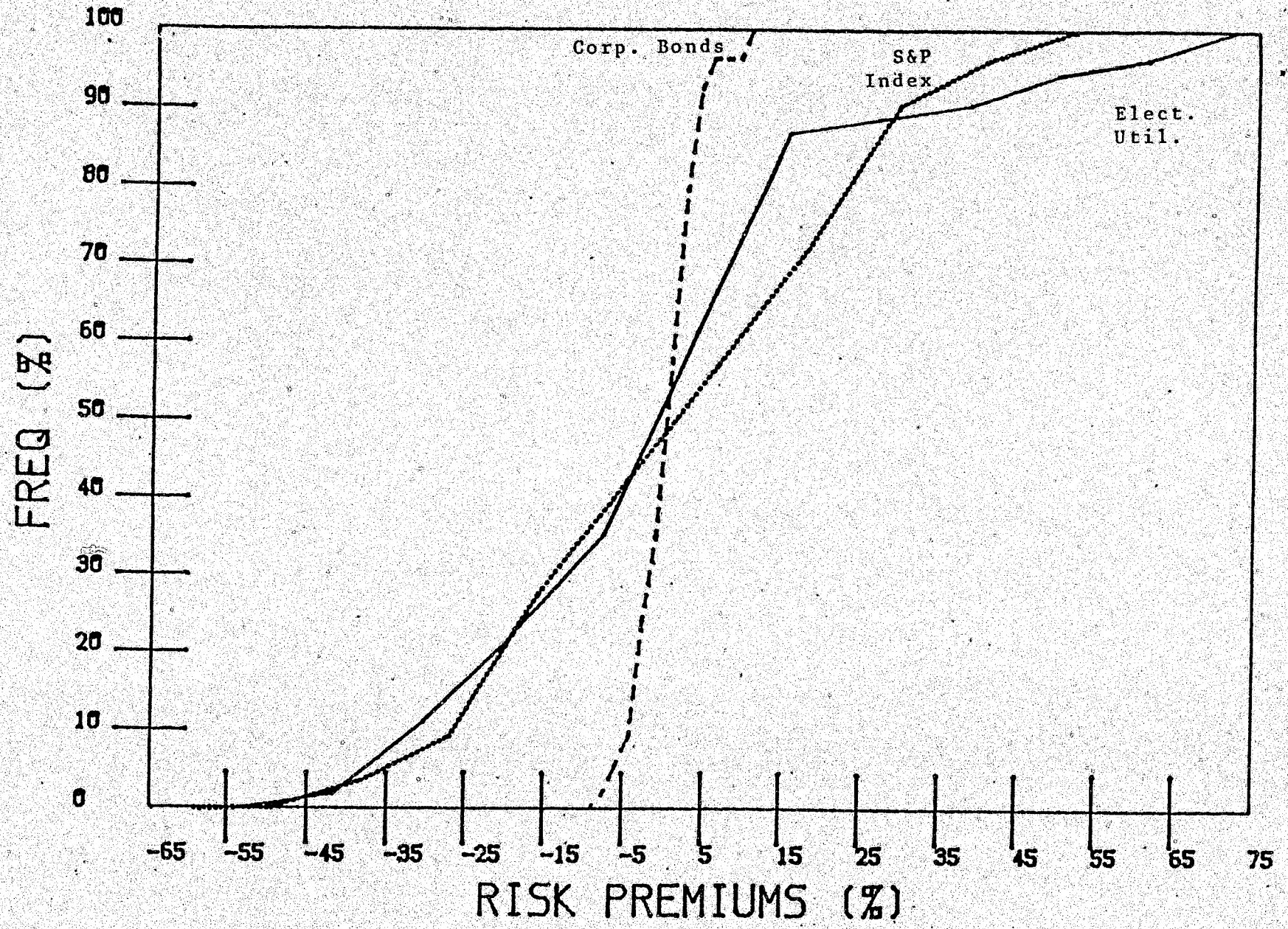
Preceding paragraphs have provided generalized findings as to returns available on S&P stocks and electric utilities in excess of those available on long-term U.S. government bonds. Behind these general findings lie the distributions of premiums, by investor holding period, that offer a clearer understanding of actual risks faced by investors. For example, even though the average premiums available to both the S&P and utility investor have been significantly above those on corporate bonds, what has been the potential for negative premiums, i.e., returns below that available on government bonds? And for those who lean toward a more optimistic view, how large were the available positive premiums? Furthermore, to what extent could those

investors with longer holding periods avoid a portion of that risk faced by the short-term investor? The remaining paragraphs of this article will shed light into these areas.

Figure 2 graphically depicts the cumulative frequency distribution of return on S&P stocks, electric utility stocks, and corporate bonds for the period 1929 to 1982. These premiums are calculated as the difference between returns on the indices and returns available on long-term government bonds. The curves plotted reflect results from one-year holding periods and therefore correspond to the arithmetic mean returns and premiums shown in Tables 1 and 2. The cumulative form of the distribution was chosen so that the approximate number, or percent, of positive and negative annual premiums is apparent. As an example, during 1929 to 1982 approximately 37% of the 54 annual premiums calculated between utility stocks and government bonds were less than zero. Each point plotted on the curve has as its x-coordinate the mid-point of a half-standard deviation interval to which the frequency (the y-coordinate) applies. The curves represent the distribution of premiums falling between ± 3 standard deviations of the average premiums. Premiums falling outside this range have been lumped into the frequency shown at an end point of the curve. In instances in which such outliers exist, the abscissa of the end point may understate that which would otherwise apply.

Figure 2 reinforces the perception that the S&P and utility indices have greater inherent risk than bonds and offer insight into the nature of these risks. Although corporate bonds recorded negative premiums almost as

Cumulative Frequency Distributions
of Available Return Premiums Over Long-Term Government Bonds
Assuming a One Year Investor Holding Period
1929-1982



frequently as the utilities (35% vs. 37%), the average absolute value of these premiums was considerably less (2.8% vs. 18.3%). Comparing average negative premiums found for S&P and utility stocks, one finds that the utilities recorded the larger value (18.3% vs. 15.8%). Subsequent to the early 1940's, however, utilities have recorded fewer negative premiums than the S&P stocks (27.5% vs. 32.5%), and these negative premiums have been smaller in absolute value (9.8% vs. 12.5%). Contents of Table 3 summarize these findings as to the probability and size of negative premiums.

Table 3 also contains summarized information on positive premiums earned from investing in these three categories of securities. We know from preceding discussion that the frequency and size of positive premiums are more than sufficient to offset those that are less than zero. For both the S&P and utility indices the frequency and average size of negative premiums are decreased by omission of data from the period 1929 through 1942. The average size of potential gains is, however, also reduced by omission of this data.

We recall at this point that all of the data presented in the preceding section were computed from one-year holding period returns. A final topic to be addressed is the effect on risk and rewards of varying the holding period length. We would expect that both risk and reward would be lessened by extending the holding period beyond one year. Focusing on utility stocks, Figure 3 graphically depicts this expected relationship. By increasing the holding period from one to five, and then ten years, the range of available premiums declines significantly. The largest short-fall below government bond returns is reduced from approximately 26 percentage points, for one-year holding periods, to about 11 percentage points for ten-year periods.

Table 3

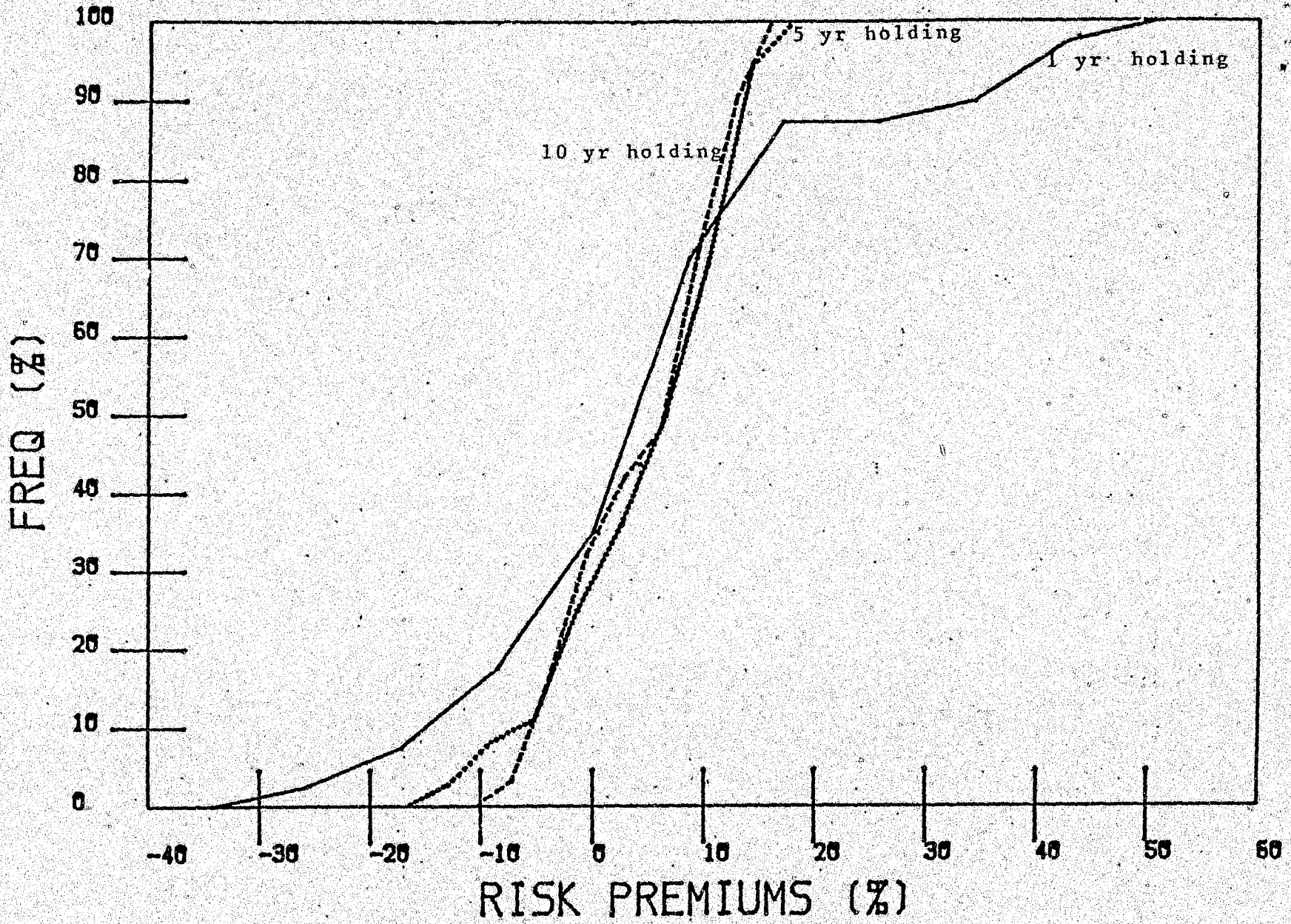
Summary Statistics on One-Year Returns

from Corporate Bonds and S&P and Utility Indices

1929 to 1982 and 1942 to 1982

		1929-1982	1943-1982
Portion of premiums that were negative	S&P Index:	40.7%	32.5%
	Utility Index:	37.0	27.5
	Corp. Bonds:	35.2	32.5
Average of negative premiums	S&P Index:	15.8	12.5
	Utility Index:	18.3	9.8
	Corp. Bonds:	2.8	3.1
Average of premiums greater than or equal to zero	S&P Index:	22.4	20.4
	Utility Index:	16.9	15.7
	Corp. Bonds:	2.6	2.2

Figure 3
Cumulative Frequency Distributions of Return Premiums for Electric Utility Stocks by Length of Investor Holding Period
1943-1982



The figure further reveals that the greater reduction in risk and reward occurs by extending the holding period from one to five years. Although additional reduction in risk is gained by extending to a ten-year holding period, this reduction is relatively minor as shown by the similar shapes and location of the five and ten-year cumulative frequency distributions.

Effects of the investor holding period on available premiums are summarized for electric utilities in Table 4 along with comparative information for corporate bonds and S&P stocks. On a comparative basis, investors in the utility index have been unable to reduce the average, or percentage, of negative premiums by increasing holding period length to the extent shown for corporate bonds and the S&P Index. One quarter of even the ten-year holding period premiums were negative for the utility index as opposed to less than 10% for bonds and S&P stocks Also, the average negative premium on utility stocks for five and ten-year holding periods exceeded comparable averages for bonds and S&P stocks. Electric utilities have, however, maintained, through extended holding periods, average positive premiums to a greater degree than either bonds or the S&P stocks. By extending from a one to a ten-year holding period, the average positive premiums for bonds and S&P stocks declined 73% and 53%, respectively. Electric utilities, on the other hand, experienced a decline in average positive premiums of 41%.

Summary of Findings and Conclusions

An index of electric utility stocks, i.e., Moody's 24 Electrics, falls between

Table 4

Summary Statistics on One, Five, and Ten-Year Returns

from Corporate Bonds and S&P and Utility Indices

1943-1982

		1-Year Holding	5-Year Holding	10-Year Holding
Neg. Premium				
Frequency:	S&P	32.5%	16.7%	9.7%
	Elect.	27.5	22.2	25.8
	Corp.	32.5	27.8	6.5
Avg. Neg. Prem.:	S&F	12.50	4.16	1.64
	Elect.	9.84	4.93	2.73
	Corp.	3.14	0.29	0.17
Avg. of Prem. $\geq$ 0:	S&P	20.37	11.25	9.65
	Elect.	15.66	9.72	9.18
	Corp.	2.20	0.79	0.60

the S&P Index and long-term corporate bonds in the risk premium hierarchy. During the period 1929 to 1982, electric utility average compound annual returns exceeded that available on long-term government bonds by 150 basis points compared to premiums of 480 and 70 basis points for the S&P Index and corporate bonds, respectively. The frequency distribution of one-year holding period returns for the electrics over this period follows a pattern similar to that for the S&P Index. Wide fluctuations in size of premiums have been recorded for both these indices. Premiums have ranged from -40 (returns were less than those on government bonds) to +70 percentage points for electrics and from -40 to +50 percentage points for the S&P Index.

The wider range in premiums for electric utilities is an indication of greater variability in annual returns than that recorded for the S&P stocks. Calculation of standard deviations verified that greater variation occurred in utility returns than for S&P stock returns during the 1929 to 1982 period. Subsequent to 1942, utilities have, however, recorded less volatility in returns than the S&P stocks. The appropriateness of the risk/return relationship for electric utilities is unclear from analysis results. Using standard deviation of one year returns as the sole measure of risk, the data prior to 1942 appear to disrupt the expected risk/return relationship. Data subsequent to 1942 appear, however, to support the expected risk return relationship. The post-1942 premiums on electrics have shown a lower probability for, and smaller, negative premiums than that recorded for the S&P stocks. Average total returns for the electrics have also been lower than that for the S&P Index during this period.

The Importance of Price Growth to DCF Determination of the Cost of Equity

Potential price change [appreciation or depreciation] is an important component of investor expectations for total return from any equity including utility stocks. Certainly, without doubt or qualification, this statement is accurate. Yet, cost of capital testimony by expert witnesses that contains reference to prospective price growth is the exception rather than the rule in rate case proceedings. Although witnesses provide extensive evidence to justify the dividend growth rates selected for use in their discounted cash flow [DCF] models, the importance of investor expectations for price growth is seldom recognized and apparently forgotten.

Price and Dividend Growth in DCF Models

DCF theory, when expressed in algebraic terms, leads to many different models of investor behavior. These models combine in equation form inputs to investor decision-making processes. Model inputs include investment horizon or holding period; expected dividend amounts; expected intervals between dividends; investor return requirements; and expected ending price. It is the cost of capital analyst's responsibility to select those inputs and the model that best match reality.

If emphasis is placed on short- to intermediate-term investor horizons, DCF theory leads to finite versions of the model. For example, the one-year model with single dividend payment at year-end has the

following form:

Model 1: $P0=(D1+P1)/(1+K1)$

"P0" is the current justifiable value, or price, of the security; "D1" the dividend amount expected at year-end; "P1" the expected year-end price; and "K1" the investor required annual return. Extension of this "finite" model to a second year leads to:

Model 2: $P0=D1/(1+K1)+(D2+P2)/(1+K1)(1+K2)$

The new variables that appear represent the expected dividend amount (D2) and investor required return (K2) during year two, and year two ending price (P2). The importance of price appreciation to investor return requirements is apparent if Model 1 above is solved for "K1". This solution reveals that "K1" equals expected dividend yield (D1/P0) plus expected price growth (P1/P0-1), not dividend growth. Similarly, expectations for price appreciation as represented by P2 are an explicit component of Model 2 and must be estimated by the investor. Dividend growth is also of importance since D1 and D2 must be estimated. But as shown in subsequent paragraphs, price growth has a greater influence on K than dividend growth in short- to intermediate-term versions of the model.

DCF theory also leads to the compact, but rather unrealistic, "constant growth" model that excludes an ending price variable. This familiar model is expressed as:

Model 3: $P0=D1/(K-g)$

where "P0" and "D1" are as defined above; K is the investor required return; and "g" the investor expected constant annual growth rate. The ending price term disappears because of simplifying assumptions that allow derivation of this version. Although a price term doesn't explicitly appear, it may be shown algebraically that the implicit price growth is equal to that expected for dividends. Therefore, prospects for long-term price growth should be consistent with the analyst's estimate for "g" in the constant growth model.

As shown above, both the finite and infinite versions of DCF models require the analyst to consider investor expectations for price and dividend growth. To do otherwise results in an incomplete and likely incorrect assessment of investor return requirements. While some may argue that assessment of investor expectations for short-term dividend growth is tantamount to assessing prospects for price growth, there is no support for this argument from either historical growth rates for prices and dividends or the investment community. Evidence from the investment community and historical data are presented below.

Historical Growth Rates in Prices and Dividends

Analysts frequently base their selection of the DCF growth rate on five or ten-year growth rate histories for dividends and earnings. Consensus near-term growth rate forecasts from the investment community have also received increasing emphasis in recent proceedings. Analysts should, of course, be cognizant of growth rate evidence from all these sources, but basing the DCF "g" on this evidence alone is contrary to the theory and assumptions on which the DCF model was formed. Both the market consensus growth forecast and the five and ten-year dividend growth

histories only provide evidence on relatively short-term growth and provide no evidence as to prospects for concomitant price growth.

A review of historical, short-term concomitant price and dividend growth rates for electric utilities reveals that price and dividends seldom grow at the same rate. Figure 1 depicts actual concomitant growth in price and dividends for Moody's Electric Utilities. All 5-year holding periods during 1929 to 1984, with end-of-calendar-year boundaries, are included. Each small square of the figure indicates actual compound annual growth in price and dividends for a specific five-year holding period. A straight line through the origin in Figure 1 has been drawn to highlight the differences between price and dividend growth during this period. Each observation (each small square) located above this line depicts a period in which dividend growth exceeds that for prices. Similarly, each observation below the line is from a 5-year period in which prices grew at a greater rate than dividends.

The average absolute difference between concomitant 5-year price and dividend growth rates was 5.9 percentage points with a standard deviation of 4.5 percentage points. Absolute differences decrease somewhat if the holding period is extended to 10-years, but large differences were still recorded for the 10-year horizon (see Figure 2). The average absolute difference between price and dividend growth within the 10-year periods was 4.3 percentage points and the standard deviation was 8.3. A review of company specific data (not shown here) reveals even greater differences between price and dividend growth than that found from computations using the Moody's Utility Index.

While some readers may attribute such large average differences to depressionary times, raw data do not support this position. Large

differences were recorded in the 1930's, but differences of equal magnitude were also recorded in the mid-1950's and 1960's.

Based on the above historical data and adaptive expectations theory, investors are unlikely to assume that future price growth equals market consensus expectations for short-term dividend growth. This statement holds, independent of whether consensus dividend growth expectations are based on short-term historical growth or investment community dividend forecasts.

Evidence of Market Expectations for Price and Dividend Growth

Electric and gas utility stocks are widely recognized in the investment community as having relatively slow-but-steady dividend growth and above average sensitivity to interest rates. Due to this sensitivity investment firms consider prospective interest rate trends along with overall prospects for stock market performance in their price growth forecasts. Dividend growth forecasts, on the otherhand, begin with an analysis of the company's fundamentals and may be used as inputs to price growth forecasts. While growth forecasts are relatively easy to obtain from investment firms, these forecasts are typically for earnings and/or dividends, not price, and do not extend beyond a five-year horizon.

Value Line is one of the few firms that regularly publishes both price and dividend forecasts (see "Ratings and Reports" section of The Value Line Investment Survey). Their dividend growth forecasts generally encompass 5-years and are derived through fundamental analysis of each company. Price growth forecasts are dependent on forecasted dividends, but are also based

on interest rate forecasts. The Value Line equation for future price is

$$Pf = cD/I$$

Expectations for future price [Pf] are shown to equal the quotient of Value Line's predicted dividend amount [D] and interest rate [I] times a constant [c]. This constant is derived from the historical relationship between D/I and price. The above equation will of course result in equal growth rate forecasts for price and dividend if "I" remains constant over time. But if "I" is expected to change, which is the rule rather than the exception, forecasted dividend and price growth will differ.

While this approach to price forecasting is specifically representative of only one firm's thinking, it is consistent with the widely held perception of interest rate sensitivity among utility stocks. Given this sensitivity, the market price of a utility's common equity will not reflect expectations for equality between long-term price growth and forecasted short-term dividend growth. Analysts who structure DCF models based on this equality are therefore straying from reality and likely to derive unrealistic results.

Potential Error From Assuming Equal Price and Dividend Growth Rates

Potential error from arbitrarily assuming equal expectations for price and dividend growth when expected growth rates actually differ is

quantified in Table 1. Table contents show a 15.0% (9%+6%) return requirement for an investor with a 5-year horizon, on a security with a 9% dividend yield, and expected long-term price and dividend growth rates of 6%. The same return requirement (15%) is indicated independent of the holding period as long as price and dividend growth expectations are both 6%. If, however, expectations for price growth during the 5-year holding period are 4%, the DCF indicated required return is only 13.3% which is 170 basis points below the 15% figure indicated by the constant growth model. As expected, the 13.3% figure falls between 13.0%, the result obtained if the 4% price growth rate is added to the 9% yield, and the 15.0% figure obtained using the 6% dividend growth.

The reader should note that adding expected price growth, not dividend growth, to the 9% yield figure provides the closer estimate of actual expected return shown in column 5 of the table. Similarly for 10-year holding periods, adding the expected price growth rate to dividend yield provides a more accurate indication of the investor required return than use of expected dividend growth. Only after extending the holding period beyond 10 years, does expected dividend growth assume greater significance in determining investor return requirements. For example, dividend growth expectations for the 20-year holding period shown in Table 1 have a greater influence on required returns than expected price growth. The changeover in significance of dividend growth occurs during the 15th year, given the yield and growth assumptions for Table 1.

TABLE 1

Potential Error From Assuming Equal Price and Dividend Growth When Growth Rate Expectations Actually Differ

Holding Per. (yrs.)	D1/P (%)	Div. Growth Rte. (%)	Prc. Growth Rte. (%)	Expected* Return (%)	Potential Error (%)
5	9	6	2	11.66	-3.34
"	"	"	4	13.31	-1.69
"	"	"	6	15.00	0.00
"	"	"	7	15.84	0.84
"	"	"	8	16.69	1.69
10	9	6	2	12.44	-2.56
"	"	"	4	13.72	-1.28
"	"	"	6	15.00	0.00
"	"	"	7	15.69	0.69
"	"	"	8	16.38	1.38
20	9	6	2	13.64	-1.36
"	"	"	4	14.25	-0.75
"	"	"	6	15.00	0.00
"	"	"	7	15.44	0.44
"	"	"	8	15.91	0.91

*Calulated using an iterative, computerized approach to solve the indicated DCF equation for K

Summary and Conclusions

Price growth expectations are an explicit input to finite horizon DCF models and an implicit input to the constant growth, infinite horizon version. Significant inaccuracies in DCF estimates of investor return requirements may occur if price growth expectations are ignored. Price growth expectations do, in fact, have a greater influence on required return estimates than dividend growth for short- to intermediate-term investment horizons.

Neither short-term historical, or forecasted, dividend growth rates offer an adequate basis for estimating the growth rate required in DCF analyses. Such data is inadequate because prospects for both price and dividend growth are known to influence the investment decision. Furthermore, historical data reveal wide differences between actual price and dividend growth rates over various short- to intermediate-term periods. Based on adaptive or rational expectations theory, investors are unlikely to assume price and dividends grow at the same rate in future periods.

Evidence on concomitant price and dividend growth is available from historical data such as that contained in Moody's Public Utility Manual and Standard and Poor's Daily Stock Price Record. Short-term price growth forecasts are also available from investment firms such as Value Line. Both long-term historical and forecasted price and dividend growth rates, available from these sources, should be considered in determination of growth rates used in DCF models to estimate the cost of equity capital.

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Q.4. Identify and provide copies of any and all documents whatsoever which each witness identified in response to Interrogatory 1, above, relied upon or considered in reaching any qualitative or quantitative judgments or conclusions contained in his or her testimony or which was or will be used as a basis for other GSA testimony.

A.4. Copies of the Blue Chip Economic Indicators (December 10, 1985) relied on by Mr. Kelley and Mr. Winter and the The Blue Chip Financial Indicators (January 1, 1986); Dr. Kopprasch's article entitled Options and Futures: Strategic Tools for Portfolio Management (Part I); and the portions of reports from Merrill Lynch, Prudential-Bache, Value Line and Salomon Brothers on which Mr. Winter relied are attached. Other reports from the investment community on which Mr. Winter relied, such as the S&P Bond Guide or Moody's Bond Record have not been copied because of their voluminous nature, but are available for viewing at GSA's Central Office. Mr Winter has also relied on library holdings of some publications, that are not available for copying, and numerous other text books, articles, documents, etc. such as those associated with the Chartered Financial Analyst program. While a comprehensive list of all such documents has not been maintained, most of the textbooks and articles are available for review in his Washington, D.C. office.

(d) Whether the model or analysis has been used in the preparation of testimony, exhibits, studies or reports in any other proceeding and, if so, state the date, location and relevant docket number for each such proceeding, and identify the responsible party and witness(es);

(e) Whether the model or analysis is generic in nature or has been developed from Limerick-specific data.

A.7. (a) The DCF model, as applied to cost of capital determination in regulatory proceedings, is attributed to Myron Gordon, who documented his work in this area in The Cost of Capital to a Public Utility, MSU Public Utility Studies, 1974.

(b) See (a.) above.

(c) The DCF model utilized by Mr. Winter is computerized and, in its current form, is executed using GSA's C-3 computers. Both FORTRAN and BASIC codings of the model's logic were prepared by Mr. Winter. Mr. Winter is not aware of the current memory requirements for this model.

(d) Mr. Winter has relied on the current, or earlier, versions, of this model since 1980. The list of cases in which this model has been applied is shown in response to question 3, above, beginning with the Texas Power and Light case of May 1981.

(e) N/A

BLUE CHIP FINANCIAL FORECASTS

What top analysts are saying about interest rates, monetary policy and loan demand

Vol. 5, No. 1 January 1, 1986

INTEREST RATE FORECASTS LOWERED

On Interest Rates The composite judgment of this month's round-up of 46 Blue Chip financial analysts revealed a small downward shift in short-term rates through the first half of 1986 and over one-half a point drop in most long-term rates from that reported just a month ago. The forecast for short-term rates inched back up from mid-1986 through the initial quarter of 1987, but long-term rates were seen to hold the one-half point or more decline.

For example, three-month T-Bills, which had been expected to average 7.3% by the second quarter of 1986, are now seen to ease downward to 7.0% (where they are now)--moving gradually back upward to 7.4% by the first quarter of 1987. Also, long-term Corporate Aaa rates are now forecast to level at 10.3% by the first quarter of this year (compared to 10.8% last month) and then to stay at this lower plane through early 1987 (see summary table below). Most of the downward shift in the projections for the cost of money resulted from an upward revision in the expected rates of change of the monetary base and M1 money stock aggregates (see top of p. 7).

Major Factors Expected To Influence Rates During 1986 In response to our semiannual special question, the panel saw inflation stability, progress in lowering federal budget deficits, expected slowing in the rate of Real GNP growth, and further easing of Federal Reserve monetary policy as the major factors that will help lower rates in 1986 and early 1987. These factors were ranked highest by the 16 analysts that clearly anticipated lower rates during the next five quarters (see p. 8 for factors that might produce higher rates).

SUMMARY OF INTEREST RATE DATA

	Actual		Average Forecasts - Quarterly				
	3Q	Week End.	1Q	2Q	3Q	4Q	1Q
Interest Rates[1]	1985	12/20/85	1986	1986	1986	1986	1987
1. Prime Rate	9.5%	9.5%	9.3%	9.3%	9.4%	9.5%	9.5%
2. Federal Funds	7.9	8.1	7.7	7.7	7.8	7.9	7.9
3. Comm. Paper 1 mo.	7.7	7.8	7.5	7.6	7.7	7.8	7.8
4. T-Bills 3 Mo.	7.1	7.0	7.0	7.0	7.2	7.3	7.3
5. T-Notes 3 Yr.	9.3	8.2	8.6	8.6	8.7	8.7	8.6
6. T-Bonds 30 Yr.	10.6	9.4	9.6	9.6	9.6	9.6	9.6
7. Mun. Bonds 20-Bond	9.1	8.4	8.3	8.3	8.3	8.3	8.3
8. Corp. Aaa Bonds (Seas.)	11.0	10.0	10.3	10.3	10.3	10.3	10.2
9. Utilities A (Seas.)	11.8	10.7	11.0	11.0	11.0	11.0	11.0
10. Home Mortgages	12.1	11.1	11.4	11.3	11.4	11.3	11.3

[1] See P. 7 for detailed definitions and sources of data.

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First Quarter 1986

Interest Rate Forecasts

Key Assumptions Behind Interest Rate Forecasts

ANA LYST IDEN-TITY CODE	PERCENT										—Money Supply— Annual Rate-% (Q-Q Change)			—Borrowing— Annual Rate-$bil. (Q-Q Change)				
	—Short Term—				Inter.	—Long Term—												
	1. Prime Rate	2. Fed. Funds	3. Com. Paper 1-Mo.	4. T-Bills 3-Mo.	5. T-Notes 3-Yr.	6. T-Bonds 30-Yr.	7. Mun. Bonds 20-B	8. Corp Aaa B (Seas)	9. A Util. (Seas)	10. Home Mtg. FHLMC	11. Mon. Base	12. Money Stock M1	13. Money Stock M2	14. Cons. Inst. (Net)	15. Com & Ind. Loans	A. Real GNP	B. GNP Defl. (Prices)	C. Cons. Price Index
J	10.2H	9.4H	9.3H	8.5H	9.9H	10.5H	8.5	11.0	12.0H	12.4H	5.8	5.0	7.1	48.8	34.8	4.6	4.7	4.6
JJ	10.0	8.2	8.2	7.6	8.8	9.8	8.4	10.3	11.2	11.4	8.0	8.0	8.0	60.0	50.0H	6.0	3.0	3.0
CC	9.8	8.2	8.0	7.4	9.6	10.2	9.0	10.8	11.7	11.9	7.5	10.0	7.0	45.0	30.0	6.5	4.2	4.3
L	9.6	8.1	8.0	7.6	9.0	10.2	8.9	10.7	11.4	11.8	9.5	9.0	10.0	81.0	—	7.3H	3.1	4.0
U	9.5	7.8	7.7	7.0	8.9	10.1	8.8	10.4	11.5	10.7	7.5	7.0	8.5	25.0	15.0	3.0	3.5	4.0
N	9.5	7.7	7.2	6.4L	9.0	10.1	9.1H	10.8	11.2	11.8	8.0	7.0	8.0	—	—	4.9	4.2	4.2
XX	9.5	7.2	7.2	6.5	8.0	9.3	7.8	10.0	10.9	11.2	6.0	5.5	7.5	—	—	3.0	3.5	4.0
HH	9.5	7.8	7.7	7.2	8.8	9.7	8.3	10.3	11.1	11.2	—	6.6	7.1	—	41.1	5.2	3.5	4.1
SS	9.5	8.0	7.9	7.2	8.2	9.3	8.2	10.0	10.7	10.9	6.7	7.0	7.5	84.0	28.0	2.5	3.8	3.8
MM	9.5	8.1	7.8	7.2	9.0	9.8	8.7	10.5	11.2	11.4	9.9	11.1	8.8	52.0	17.0	4.5	5.2H	5.9H
TT	9.5	7.9	7.9	7.1	8.3	9.7	8.6	10.2	10.9	10.9	6.8	7.5	7.6	—	—	3.5	4.1	4.2
ZZ	9.5	7.8	7.7	7.0	8.2	9.5	8.6	10.4	11.3	11.4	8.5	9.0	7.0	55.0	30.0	3.5	3.8	3.5
RR	9.5	8.0	7.7	7.1	8.8	9.7	8.7	10.6	11.4	11.7	6.5	7.3	6.8	44.0	29.0	4.6	3.9	3.9
AA	9.5	8.0	7.9	7.3	8.5	9.6	8.3	10.0	10.8	11.2	3.7	7.5	7.0	60.0	20.0	4.3	3.5	3.1
V	9.5	7.7	7.4	7.0	8.4	9.6	8.5	10.1	10.7	11.6	6.5	9.0	9.5	60.0	35.0	2.9	4.0	3.8
Q	9.4	7.8	7.5	7.2	8.6	9.5	8.4	10.1	11.0	12.2	8.1	8.6	7.7	60.0	15.0	3.0	3.8	4.1
F	9.4	8.0	8.0	7.3	8.6	9.6	7.9	10.0	10.4	11.7	5.9	7.7	5.9	48.0	30.0	2.0	4.4	3.3
NN	9.4	7.5	7.5	7.0	8.5	9.7	8.4	10.4	11.2	11.6	6.5	9.0	7.5	55.0	30.0	3.5	3.7	3.5
BB	9.3	8.2	7.6	7.2	8.3	9.4	8.7	10.7	11.3	11.7	7.0	10.0	7.5	40.0	15.0	-4.0L	2.5	3.3
PP	9.3	7.5	7.7	7.1	9.0	10.0	8.8	10.7	11.2	11.5	7.1	7.5	7.8	50.0	30.0	2.5	3.0	3.4
O	9.3	8.0	7.7	7.0	8.2	9.6	8.5	10.2	11.0	11.1	7.0	8.0	8.0	40.0	30.0	3.0	3.0	3.5
WW	9.3	7.5	7.2	6.8	8.3	9.5	8.3	10.3	11.1	11.4	6.5	6.9	7.8	50.0	22.0	2.6	2.6	—
W	9.3	7.5	7.6	7.1	9.0	9.5	7.6	10.4	11.2	11.2	7.0	6.5	7.0	55.0	25.0	1.1	3.6	4.0
OO	9.3	7.7	7.6	7.1	8.7	10.0	8.5	10.4	11.5	11.7	8.0	8.0	5.0	50.0	15.0	2.3	5.0	4.5
DD	9.3	7.5	7.5	6.9	9.2	9.8	8.2	10.2	10.8	11.8	—	7.7	7.8	—	—	2.7	3.2	3.3
P	9.2	7.4	7.3	6.9	8.3	9.5	8.3	11.3H	10.8	11.2	7.0	10.0	8.5	30.0	0.0L	2.5	3.3	3.0
G	9.2	7.6	7.5	7.0	8.0	9.2	7.7	9.8	10.8	11.2	7.5	8.0	8.5	70.0	25.0	2.1	3.5	3.3
FF	9.2	7.2	7.0	7.0	8.2	9.2	8.0	9.7	10.3L	11.2	9.0	6.0	7.0	95.0	40.0	3.6	3.5	3.0
K	9.2	7.7	7.6	7.0	8.3	9.4	8.7	10.5	11.3	11.7	6.7	7.4	8.0	45.0	30.0	2.7	3.6	3.6
C	9.2	7.4	7.6	6.9	—	9.3	8.2	10.1	10.3L	10.8	—	7.5	6.5	108.0H	16.0	2.7	4.1	4.0
B	9.2	7.6	7.6	7.0	8.4	9.8	8.1	10.3	10.9	11.2	5.9	6.1	6.4	47.0	24.0	0.2	3.7	3.7
YY	9.2	7.6	7.5	6.8	8.6	9.6	8.8	10.3	11.1	11.7	—	9.0	9.0	65.0	25.0	3.6	3.5	3.5
A	9.1	7.3	7.2	6.7	8.2	9.5	8.4	—	10.5	10.7	9.2	6.1	8.9	60.0	9.2	4.6	3.6	3.2
KK	9.1	7.3	7.3	6.9	8.9	9.6	8.2	10.2	11.2	12.0	5.6	6.1	6.4	48.6	36.0	1.0	3.5	3.5
S	9.0	7.5	7.3	6.8	8.5	8.6L	8.2	10.1	10.7	11.0	8.5	6.5	10.4	55.0	20.0	1.3	3.5	2.9
EE	9.0	7.5	7.5	7.0	9.0	10.0	8.5	10.5	11.0	11.0	5.0	6.0	6.0	45.0	25.0	0.0	3.5	3.5
H	9.0	7.8	7.7	7.0	8.0	9.2	7.8	9.8	10.5	10.8	6.0	6.0	8.0	—	—	4.6	3.5	3.8
E	9.0	7.4	7.3	6.9	9.1	9.2	7.7	9.7	10.5	11.6	7.0	7.5	7.6	50.0	26.0	4.2	4.7	4.8
R	9.0	7.5	7.5	7.0	8.5	10.0	8.5	10.5	11.5	11.5	8.0	8.0	10.0	40.0	30.0	2.0	3.0	2.0
GG	9.0	7.2	7.0	6.6	8.4	9.5	7.8	10.0	10.7	11.1	7.0	7.0	4.9	45.0	20.0	2.0	2.8	2.8
VV	9.0	7.0L	7.3	6.6	9.1	10.0	—	10.3	11.2	11.6	5.0	8.0	7.0	50.0	20.0	2.0	3.5	3.5
QQ	9.0	7.4	7.4	6.9	8.0	9.6	8.0	10.2	10.8	11.0	10.0H	10.0	11.0H	71.0	42.0	5.0	3.0	2.5
UU	9.0	7.2	7.1	7.0	8.5	8.7	8.5	9.7	10.5	11.0	3.3L	4.0	4.2L	10.0L	31.0	0.2	1.9L	2.7
D	9.0	7.0L	7.0	6.5	8.0	9.3	8.3	9.8	10.3L	11.3	—	7.0	7.0	40.0	30.0	2.5	3.0	3.5
Y	8.8	7.5	7.0	6.5	7.8	9.0	7.5L	9.5L	10.7	11.0	7.0	15.0H	7.5	45.0	15.0	2.0	2.0	1.0L
LL	8.3L	7.1	6.9L	6.6	7.7L	9.0	7.7	10.1	10.4	10.1L	4.3	3.9L	7.5	24.0	13.0	1.7	4.4	3.1
JAN: AVG.	9.3	7.7	7.5	7.0	8.6	9.6	8.3	10.3	11.0	11.4	7.0	7.6	7.6	52.7	25.5	2.9	3.6	3.6
TOP10	9.7	8.2	8.1	7.4	9.2	10.1	8.8	10.8	11.5	11.9	8.9	10.2	9.5	75.4	37.0	5.3	4.5	4.5
BOT10	8.9	7.2	7.1	6.6	8.0	9.1	7.8	9.8	10.4	10.8	5.0	5.5	5.9	33.8	13.0	0.6	2.7	2.6
DEC: AVG.	9.4	7.8	7.7	7.2	9.1	10.1	8.7	10.8	11.5	11.8	6.9	7.4	7.6	50.3	26.1	3.1	—	3.6
DIFF. IND.[1]	11%	20%	17%	14%	6%	0%	11%	3%	6%	6%	36%	46%	40%	21%	62%	—	—	—

[1] Diffusion Index: Percent of cooperators who raised their interest rate forecast from the prior month.

Second Quarter 1986

Interest Rate Forecasts

Key Assumptions Behind Interest Rate Forecasts

ANALYST IDENTITY CODE	1. Prime Rate	2. Fed. Funds	3. Com. Paper 1-Mo.	4. T-Bills 3-Mo.	5. T-Notes 3-Yr.	6. T-Bonds 30-Yr.	7. Mun. Bonds 20-B	8. Corp Aaa B (Seas)	9. A Util. (Seas)	10. Home Mtg. FHLMC	11. Mon. Base	12. Money Stock M1	13. Money Stock M2	14. Cons. Inst. (Net)	15. Com & Ind. Loans	A. Real GNP	B. GNP Defl. (Prices)	C. Cons. Price Index
	PERCENT — Short Term				Inter.		Long Term				Money Supply — Annual Rate-% (Q-Q Change)			Borrowing — Annual Rate-$bil. (Q-Q Change)				
J	11.2H	10.2H	10.0H	9.0H	10.4H	10.7H	8.7	11.5H	12.3H	12.6H	4.6	5.1	7.5	47.2	41.6	3.7	5.6H	5.6
JJ	10.4	8.6	8.6	7.9	9.0	10.0	8.6	10.5	11.4	11.6	6.0	6.0	8.0	60.0	50.0H	4.0	3.0	3.0
HH	10.3	8.8	8.7	7.9	9.4	10.1	8.2	10.6	11.4	11.6	—	6.3	8.0	—	45.7	5.1	3.5	4.3
FF	10.2	8.2	8.0	7.9	8.6	10.1	8.8	10.6	11.2	12.1	9.0	6.0	7.0	78.0	50.0H	3.0	4.0	3.5
CC	10.0	8.3	8.1	7.6	9.8	10.3	9.2H	11.0	11.9	12.1	6.5	8.0	7.5	40.0	35.0	5.0	4.6	4.7
L	10.0	8.5	8.4	8.0	9.5	10.7H	9.1	11.2	11.9	12.2	10.0	10.0	10.5	87.0	—	8.2H	3.2	3.9
XX	10.0	8.0	8.0	7.5	8.8	9.8	8.0	10.5	11.3	11.7	6.0	5.5	7.5	—	—	5.0	4.5	4.5
MM	9.9	8.4	8.1	7.4	9.4	10.4	9.0	11.1	11.9	11.9	11.1H	11.1	10.3	46.0	17.0	4.1	4.8	6.0H
RR	9.8	8.5	8.3	7.6	9.2	10.0	8.9	10.9	11.7	12.0	6.0	6.0	7.0	36.0	35.0	4.0	4.1	4.2
SS	9.7	8.3	8.2	7.4	8.4	9.5	8.3	10.2	10.9	11.0	7.0	6.0	7.6	90.0	48.0	3.0	4.0	4.0
TT	9.6	8.1	8.3	7.5	8.8	10.0	8.8	10.5	11.2	11.1	6.8	7.4	7.7	—	—	5.0	4.4	4.5
AA	9.6	8.1	8.0	7.4	8.6	9.6	8.3	10.0	10.9	11.2	6.5	7.0	6.5	55.0	30.0	4.0	3.0	3.2
U	9.5	7.7	7.6	6.9	8.8	10.1	8.7	10.4	11.4	10.6	7.0	7.0	8.0	25.0	15.0	1.0	4.5	5.0
N	9.5	7.4	7.5	6.7	8.9	10.0	9.0	10.7	11.1	11.7	7.0	7.0	8.0	—	—	4.0	4.3	4.3
E	9.5	7.7	7.6	7.2	9.2	9.3	7.7	9.7	10.5	11.7	6.8	7.2	7.5	47.0	28.0	3.2	5.0	5.2
F	9.5	8.3	8.4	7.5	8.9	9.8	8.1	10.3	10.7	11.8	5.8	8.8	6.4	50.0	32.0	4.2	3.4	3.2
ZZ	9.5	8.0	7.8	7.0	8.2	9.5	8.6	10.4	11.3	11.4	8.0	8.5	7.0	60.0	40.0	3.5	4.0	4.0
YY	9.5	8.0	8.0	7.4	9.2	10.2	9.2H	10.8	11.8	12.2	—	9.0	9.0	60.0	35.0	3.6	4.5	4.5
V	9.5	7.9	7.6	7.2	8.6	9.8	8.6	10.3	11.0	11.7	6.5	8.5	9.0	60.0	40.0	2.5	4.7	4.2
H	9.3	8.0	7.8	7.1	8.1	9.0	7.5	9.5	10.3	10.6	6.8	6.5	7.8	—	—	4.5	3.5	4.1
G	9.3	7.8	7.7	7.2	8.3	9.5	7.9	10.1	11.1	11.2	7.0	7.5	9.0	65.0	30.0	2.7	4.3	3.8
WW	9.3	7.8	7.4	7.0	8.5	9.6	8.2	10.6	11.4	11.0	6.4	7.5	7.9	50.0	26.0	2.5	3.6	—
D	9.3	7.3	7.3	6.8	8.3	9.5	8.5	10.0	10.5	11.5	—	6.5	6.5	35.0	25.0	1.5	3.5	4.0
A	9.2	7.5	7.4	7.0	8.4	9.6	8.4	—	10.6	10.8	7.7	5.8	8.0	58.0	24.4	3.5	3.8	3.8
NN	9.2	7.4	7.4	6.9	8.4	9.6	8.3	10.3	11.0	11.4	6.5	9.0	8.0	45.0	25.0	3.5	3.7	3.5
O	9.1	7.7	7.6	6.9	8.2	9.5	8.4	10.2	10.9	11.0	7.0	8.0	8.0	40.0	30.0	3.0	3.0	3.5
BB	9.0	8.1	7.5	7.1	8.2	9.3	8.7	10.6	11.2	11.7	8.0	12.0H	7.5	30.0	10.0	-3.0	3.0	3.3
EE	9.0	7.0	7.0	6.5	9.0	9.5	8.0	10.5	11.0	11.0	5.0	5.5	6.0	40.0	20.0	2.0	3.0	3.5
PP	9.0	7.7	7.8	7.0	9.0	10.1	8.7	10.5	11.4	11.5	6.8	7.0	7.0	45.0	25.0	3.0	3.9	3.6
R	9.0	7.2	7.0	7.0	8.5	10.0	8.2	10.5	11.5	11.5	6.0	6.0	8.0	40.0	20.0	0.0	3.0	3.0
Q	9.0	7.8	7.5	7.2	8.6	9.2	8.3	9.9	10.8	12.3	7.6	7.1	8.4	60.0	16.0	2.0	3.9	4.2
K	9.0	7.5	7.2	6.8	8.2	9.3	8.4	10.2	11.0	11.7	6.5	7.5	8.5	40.0	25.0	2.0	3.9	3.9
W	9.0	7.3	7.2	6.8	8.6	9.4	7.5	10.0	10.8	10.8	8.0	8.0	9.0	50.0	20.0	2.2	3.7	4.0
C	9.0	7.1	7.5	6.5	—	9.1	8.1	9.9	10.1	10.7	—	7.0	7.5	102.0H	15.0	2.0	4.1	4.2
OO	9.0	7.4	7.3	6.8	8.4	9.5	8.0	9.8	11.0	11.2	7.0	8.0	4.0	45.0	14.0	1.4	5.0	5.5
B	9.0	7.5	7.3	6.6	8.3	9.4	7.9	10.1	10.6	10.9	6.2	5.8	6.4	40.0	23.0	2.0	2.9	3.5
DD	9.0	7.3	7.3	6.7	9.1	9.7	8.0	10.1	10.6	11.6	—	6.3	7.4	—	—	3.1	3.9	3.5
P	8.8	7.0	6.9	6.6	8.1	9.3	8.2	11.0	10.5	10.8	7.0	10.0	9.0	25.0	-5.0L	2.7	3.0	2.5
VV	8.8	7.0	7.0	6.5	9.0	9.8	—	10.0	11.0	11.5	5.0	6.0	6.0	60.0	30.0	2.0	3.7	3.7
KK	8.8	7.1	7.1	6.6	8.6	9.3	7.9	10.2	10.9	11.8	4.5	5.9	6.5	39.6	33.0	1.5	2.7	3.4
S	8.6	7.2	7.0	6.3	7.9	8.2	7.6	9.3	10.0	10.3	7.0	7.5	8.0	45.0	20.0	3.3	2.5	2.7
Y	8.5	7.0	6.5	6.0	7.3	8.5	7.0	9.0L	10.2	10.5	6.5	12.0H	7.3	40.0	15.0	3.2	2.0	1.2
GG	8.5	6.7	6.5	6.1	7.9	9.0	7.4	9.5	10.2	10.5	10.0	10.0	6.6	45.0	18.0	4.0	2.5	2.5
QQ	8.5	7.3	7.3	6.8	7.9	9.3	7.6	9.9	10.5	10.7	10.0	10.0	11.0H	78.0	45.0	5.1	3.0	2.5
UU	8.5	7.0	6.9	6.7	8.3	8.5	8.3	9.5	10.3	10.8	4.0L	3.8L	3.9L	5.0L	41.0	1.3	2.7	2.7
LL	7.7L	6.2L	6.4L	5.7L	6.5L	8.0L	6.8L	9.6	9.6L	10.0L	6.6	5.8	7.2	18.0	4.0	-3.6L	1.8L	-1.6L
JAN: AVG.	9.3	7.7	7.6	7.0	8.6	9.6	8.3	10.3	11.0	11.3	6.9	7.4	7.6	49.5	27.3	2.9	3.7	3.7
TOP10	10.1	8.6	8.5	7.8	9.4	10.3	8.9	10.9	11.7	12.1	8.9	10.2	9.4	74.0	43.6	5.0	4.8	5.0
BOT10	8.6	6.9	6.8	6.3	7.8	8.8	7.5	9.6	10.2	10.6	5.3	5.5	5.9	29.4	11.9	0.4	2.6	2.2
DEC: AVG.	9.5	7.9	7.8	7.3	9.2	10.2	8.7	10.8	11.5	11.9	6.7	7.1	7.5	46.1	28.0	—	2.9	3.8
DIFF. IND.[1]	17%	23%	26%	17%	9%	3%	13%	6%	11	6%	35%	41%	40%	17%	49%	—	—	—

[1] Diffusion Index: Percent of cooperators who raised their interest rate forecast from the prior month.

Fourth Quarter 1986

Interest Rate Forecasts

Key Assumptions Behind Interest Rate Forecasts

ANA LYST IDEN-TITY CODE	1. Prime Rate	2. Fed. Funds	3. Com. Paper 1-Mo.	4. T-Bills 3-Mo.	5. T-Notes 3-Yr.	6. T-Bonds 30-Yr.	7. Mun. Bonds 20-B	8. Corp Aaa B (Seas)	9. A Util. (Seas)	10. Home Mtg. FHLMC	11. Mon. Base	12. Money Stock M1	13. Money Stock M2	14. Cons. Inst. (Net)	15. Com & Ind. Loans	A. Real GNP	B. GNP Defl. (Prices)	C. Cons. Price Index
	PERCENT				Inter.	Long Term					Money Supply Annual Rate-% (Q-Q Change)			Borrowing Annual Rate-$bil. (Q-Q Change)				
J	11.5H	10.4H	10.2H	9.3H	10.6H	10.8	8.8	11.6H	12.6	12.9H	3.8L	4.9	7.8	55.6	43.2	1.6	6.0H	5.5
JJ	10.8	9.0	9.0	8.4	9.2	10.2	8.8	10.7	11.6	11.8	4.0	4.0L	7.0	30.0	30.0	2.0	3.5	3.5
HH	10.7	9.1	8.9	8.1	9.4	10.1	8.4	10.7	11.5	11.9	—	6.4	6.8	—	39.7	3.3	3.3	4.2
CC	10.5	8.8	8.6	8.1	10.1	10.5	9.4	11.2	12.2	12.2	5.0	7.0	8.0	40.0	40.0	4.2	5.3	5.3
L	10.5	9.0	8.8	8.5	10.0	11.1H	9.3	11.6H	12.3	12.6	9.0	8.5	10.0	92.0	—	7.1H	3.4	4.0
YY	10.4	8.6	8.8	8.3	10.0	11.0	9.6H	11.5	12.8H	12.9H	—	7.0	10.0	50.0	40.0	1.5	5.0	5.0
FF	10.3	8.3	8.1	8.0	8.5	10.3	8.9	10.8	11.4	12.3	9.0	6.0	7.0	75.0	50.0	1.8	4.0	4.0
MM	10.2	8.7	8.5	7.8	9.9	10.8	9.2	11.3	12.1	12.3	10.1	9.9	14.0H	24.0	19.0	3.9	5.4	6.5H
XX	10.0	8.0	8.0	7.5	8.8	9.8	8.0	10.5	11.3	11.7	6.0	5.5	7.5	—	—	5.0	5.0	5.0
D	10.0	8.0	8.0	7.5	9.0	10.3	9.3	10.8	11.3	12.3	—	7.0	7.5	40.0	30.0	4.5	4.5	5.0
E	9.9	8.1	8.0	7.6	9.5	9.6	8.0	10.0	10.8	12.1	6.8	6.9	7.8	45.0	29.0	4.5	5.2	5.4
SS	9.8	8.5	8.4	7.7	8.7	9.7	8.5	10.3	10.9	11.0	7.0	5.0	7.2	90.0	60.0H	3.7	4.4	4.6
F	9.8	8.5	8.7	7.9	9.2	10.0	8.3	10.5	10.9	11.9	6.7	7.8	6.4	55.0	34.0	4.4	3.8	4.1
A	9.7	8.0	7.8	7.5	8.7	9.7	8.5	—	10.8	11.0	7.0	6.3	6.7	56.0	39.6	5.4	4.0	4.1
G	9.7	8.1	7.9	7.5	8.6	9.8	8.2	10.4	11.4	11.4	7.0	7.2	9.5	63.0	33.0	3.7	4.8	4.3
RR	9.7	8.4	8.2	7.5	9.3	10.0	9.0	11.0	11.8	12.0	5.8	6.6	7.0	32.0	39.0	3.4	4.6	4.5
AA	9.7	8.1	8.0	7.4	8.5	9.5	8.2	9.9	10.9	11.2	6.0	6.3	6.0	50.0	40.0	2.8	3.3	3.3
V	9.7	8.0	7.8	7.4	8.9	10.0	8.8	10.5	11.3	11.9	6.5	8.5	9.0	50.0	45.0	1.5	5.1	4.6
TT	9.6	8.2	8.5	7.7	9.0	10.2	9.0	10.7	11.4	11.3	6.7	7.2	7.8	—	—	5.2	4.8	4.9
U	9.5	7.8	7.7	7.0	8.8	10.0	8.6	10.3	11.3	10.5	7.5	7.0	8.5	30.0	10.0	1.0	4.0	4.5
N	9.5	7.7	8.1	7.3	8.8	9.9	8.9	10.6	11.0	11.6	7.0	7.0	8.0	—	—	4.0	4.3	4.3
H	9.5	8.3	8.1	7.2	8.3	8.9	7.4	9.4	10.1	10.4	7.3	6.5	6.8	—	—	3.2	3.8	4.3
PP	9.5	8.0	8.0	7.3	9.2	10.0	8.9	10.7	11.5	12.0	6.5	6.6	7.0	55.0	35.0	3.7	4.0	4.0
WW	9.5	8.0	7.8	7.4	8.8	9.8	8.5	11.0	11.6	11.6	6.5	8.0	7.5	42.0	28.0	1.8	3.5	—
ZZ	9.5	8.1	8.0	7.3	8.6	9.9	8.8	10.8	11.6	11.8	7.0	7.0	7.0	60.0	40.0	2.5	4.5	4.3
NN	9.5	7.9	8.0	7.3	8.8	10.0	8.7	10.6	11.3	11.7	6.5	8.5	8.0	35.0	20.0	3.0	3.8	4.0
DD	9.3	7.6	7.7	7.1	9.6	10.0	8.2	10.5	11.0	11.8	—	5.8	7.0	—	—	3.6	4.3	3.8
BB	9.0	8.0	7.4	7.0	8.1	9.1	8.6	10.4	11.1	11.5	10.0	12.0H	7.7	10.0	5.0	-1.0	3.0	3.5
EE	9.0	7.0	7.0	7.0	9.0	9.5	8.0	10.0	10.5	11.0	4.0	5.0	7.5	35.0	20.0	3.0	3.0	3.0
O	9.0	7.7	7.5	6.9	8.1	9.5	8.4	10.1	10.9	10.9	7.0	8.0	8.0	35.0	30.0	3.0	3.0	3.5
Q	9.0	7.8	7.5	7.2	8.6	9.2	8.3	9.9	10.8	12.2	7.1	6.2	8.3	60.0	18.0	2.5	4.1	4.3
K	9.0	7.0	7.0	6.5	8.2	9.0	8.0	10.0	10.8	11.5	6.5	8.0	8.9	35.0	25.0	1.5	3.9	4.2
W	9.0	7.0	6.8	6.5	8.2	9.0	7.2	9.8	10.6	10.6	7.0	9.0	9.0	40.0	20.0	3.1	4.7	4.1
C	9.0	7.0	7.4	6.4	—	9.0	8.0	9.8	10.0	10.5	—	7.0	7.5	100.0H	18.0	2.3	4.3	4.4
P	8.8	7.0	7.0	6.6	7.9	9.1	8.1	10.7	10.2	10.6	7.0	10.0	9.5	20.0	10.0	2.7	3.0	2.5
VV	8.8	7.0	7.0	6.5	9.0	9.8	—	10.0	11.0	11.5	4.0	5.0	6.0	50.0	35.0	2.5	4.0	4.0
B	8.8	7.2	7.2	6.5	8.1	9.3	7.6	9.9	10.4	10.8	4.8	5.3	8.8	43.0	24.0	3.8	2.7	2.9
KK	8.6	6.9	7.0	6.6	8.6	9.1	7.7	9.9	10.7	11.5	4.6	5.2	8.0	37.1	30.0	2.0	2.7	2.8
S	8.5	7.0	6.8	6.0	7.8	8.0	7.2	8.9	9.6	9.9	7.0	8.5	8.0	45.0	20.0	4.5	2.4	2.7
R	8.5	7.2	7.0	7.0	8.5	9.5	8.0	10.0	11.0	11.0	6.0	6.0	8.0	20.0	0.0L	-2.0	3.0	3.0
GG	8.5	6.8	6.6	6.2	8.1	9.2	7.5	9.7	10.4	10.8	12.0H	12.0H	7.1	50.0	24.0	5.0	2.5	2.5
UU	8.5	7.0	6.9	6.7	8.3	8.5	8.3	9.5	10.3	10.8	5.5	4.5	6.0	30.0	50.0	5.1	2.6	2.5
OO	8.4	7.1	7.0	6.5	8.0	9.1	7.7	9.3	10.6	10.6	5.0	6.0	3.0L	35.0	12.0	-2.8L	6.0H	6.5H
Y	8.0	7.0	6.3	5.8	6.8	8.0	6.5L	8.5L	9.7	10.3	6.3	10.0	7.0	35.0	20.0	4.2	2.3	2.0
QQ	8.0	7.0	7.0	6.5	7.5	9.0	7.3	9.6	10.2	10.4	10.0	10.0	11.0	86.0	49.0	5.2	3.0	2.5
LL	6.5L	5.4L	5.3L	4.7L	5.9L	6.9L	6.5L	8.6	8.3L	8.5L	8.2	7.4	8.8	6.0L	30.0	-1.8	-0.8L	-2.0L
JAN: AVG.	9.4	7.8	7.7	7.2	8.7	9.6	8.3	10.3	11.0	11.4	6.7	7.2	7.8	46.0	29.6	2.9	3.8	3.9
TOP10	10.5	8.9	8.8	8.2	9.8	10.5	9.2	11.2	12.0	12.4	9.0	9.8	10.0	73.8	45.7	5.2	5.3	5.4
BOT10	8.2	6.8	6.7	6.2	7.6	8.5	7.3	9.3	9.9	10.2	4.6	5.0	6.2	23.7	13.2	0.1	2.3	2.1
DEC: AVG.	9.7	8.0	7.9	7.4	9.2	10.2	8.7	10.8	11.5	11.9	6.7	6.8	8.0	43.5	29.0	2.8	—	4.0
DIFF. IND.[1]	23%	29%	31%	25%	11	6%	15%	8%	12	8%	38%	39%	41%	21%	47%	—	—	—

[1] Diffusion Index: Percent of cooperators who raised their interest rate forecast from the prior month.

Third Quarter 1986

Interest Rate Forecasts

Key Assumptions Behind Interest Rate Forecasts

ANALYST IDENTITY CODE	1. Prime Rate	2. Fed. Funds	3. Com. Paper 1-Mo.	4. T-Bills 3-Mo.	5. T-Notes 3-Yr.	6. T-Bonds 30-Yr.	7. Mun. Bonds 20-B	8. Corp Aaa B (Seas)	9. A Util. (Seas)	10. Home Mtg. FHLMC	11. Mon. Base	12. Money Stock M1	13. Money Stock M2	14. Cons. Inst. (Net)	15. Com & Ind. Loans	A. Real GNP	B. GNP Defl. (Prices)	C. Cons. Price Index
	PERCENT										Money Supply—Annual Rate-$ (Q-Q Change)			Borrowing—Annual Rate-$bil. (Q-Q Change)				
	Short Term				Inter.	Long Term												
J	11.8H	9.6H	9.5	8.6	10.2	10.6	8.6	11.3	12.4	12.8	6.7	6.7	9.4	57.6	33.6	-2.1L	6.7	6.4
JJ	11.2	9.4	9.4	8.8	9.4	10.4	9.0	10.9	11.9	12.2	4.0L	4.0L	7.0	30.0	30.0	2.0	4.0	4.0
YY	11.2	9.4	9.6H	9.2H	11.0H	11.5H	10.0	12.5H	13.8H	13.4H	—	7.0	10.0	40.0	32.0	0.2	7.0H	7.0
L	11.0	9.5	9.3	9.0	10.5	11.5H	9.5	12.0	12.8	13.1	8.5	7.5	9.5	9.7	—	6.3H	3.6	4.2
D	11.0	9.0	9.0	8.5	10.0	11.3	10.3H	11.8	12.3	13.3	—	7.5	8.0	45.0	40.0	5.5	5.0	5.5
CC	10.9	9.2	9.0	8.5	10.4	10.7	9.6	11.4	12.4	12.5	6.0	8.0	7.5	35.0	45.0	3.0	5.8	5.8
MM	10.8	8.9	8.9	8.2	10.0	11.0	9.3	11.7	12.5	12.5	9.0	9.3	7.4	16.0	23.0	3.5	5.8	7.4H
HH	10.5	8.9	8.8	7.9	9.2	9.9	8.3	10.4	11.2	11.7	—	4.6	7.0	—	37.3	2.4	3.8	4.1
A	10.1	8.5	8.3	7.9	8.9	9.9	8.7	—	10.9	11.2	8.0	6.1	7.0	54.0	41.6	4.8	4.2	4.5
N	10.0	8.3	8.6	7.8	8.8	9.9	8.9	10.6	11.0	11.6	7.0	7.0	8.0	—	—	3.9	4.5	4.5
PP	10.0	8.0	8.0	7.5	9.2	10.2	9.0	10.8	11.5	12.2	7.0	7.1	7.4	50.0	40.0	3.5	4.2	3.8
E	10.0	8.3	8.2	7.8	9.8	9.9	8.2	10.4	11.2	12.5	6.5	7.0	7.9	39.0	30.0	1.3	5.3	5.5
G	10.0	8.4	8.2	7.8	8.9	10.0	8.4	10.6	11.7	11.6	6.5	7.0	9.8	60.0	35.0	4.9	4.9	4.7
SS	10.0	8.7	8.5	7.8	8.9	10.0	8.7	10.5	11.0	11.1	7.0	6.8	7.8	94.0	64.0H	3.5	4.7	4.8
WW	10.0	8.3	8.0	7.7	8.9	10.2	8.8	11.0	11.6	11.9	6.9	8.0	6.8	35.0	28.0	1.6	3.6	—
FF	9.9	7.9	7.8	7.7	8.1	10.0	8.7	10.5	11.1	12.0	9.0	6.5	8.0	55.0	50.0	1.5	3.7	4.5
TT	9.8	8.3	8.5	7.7	9.1	10.5	9.2	11.0	11.7	11.7	6.8	7.1	7.8	—	—	3.9	4.8	4.9
NN	9.8	8.2	8.3	7.6	9.2	10.4	9.0	10.9	11.6	12.0	6.0	8.0	7.5	25.0	20.0	2.0	4.2	5.0
V	9.7	7.9	7.7	7.3	8.8	9.9	8.9	10.5	11.2	12.0	6.0	8.0	8.5	50.0	45.0	-0.2	4.9	4.9
F	9.6	8.3	8.3	7.7	9.0	9.6	8.3	10.1	10.5	11.7	5.0	6.4	5.8	53.0	30.0	3.4	4.5	4.4
U	9.5	7.9	7.8	7.0	8.8	9.8	8.5	10.1	11.0	10.4	7.5	7.0	9.0	30.0	15.0	3.0	4.0	4.5
H	9.5	8.3	8.2	7.3	8.0	8.9	7.3	9.3	10.0	10.2	7.5	5.5	7.0	—	—	2.4	3.8	4.0
XX	9.5	7.5	7.5	7.0	8.3	9.2	7.8	9.8	10.6	11.2	6.0	5.5	7.5	—	—	3.5	5.5	5.5
ZZ	9.5	8.5	8.2	7.4	8.8	10.1	9.0	11.0	11.8	12.0	7.0	6.5	7.5	50.0	50.0	3.0	4.5	4.6
RR	9.5	8.0	7.8	7.2	9.1	9.9	8.8	10.8	11.6	11.8	6.7	6.8	6.5	28.0	40.0	2.2	4.8	4.8
DD	9.5	7.8	7.8	7.3	9.7	10.3	8.5	10.6	11.3	12.1	—	5.1	6.7	—	—	4.1	3.9	3.8
AA	9.4	7.8	7.7	7.1	8.1	9.1	7.9	9.5	10.4	10.8	7.5	7.5	7.5	55.0	35.0	4.2	3.5	3.5
P	9.0	7.3	7.5	6.9	7.9	9.1	8.1	10.7	10.2	10.6	7.0	10.0	9.5	20.0	10.0	2.7	3.0	2.5
EE	9.0	7.5	7.5	7.0	9.0	9.5	8.0	10.0	10.5	10.5	4.5	5.0	8.0	20.0	30.0	3.5	3.5	4.0
O	9.0	7.5	7.5	6.8	8.0	9.4	8.3	10.0	10.8	10.9	6.0	7.0	7.0	35.0	30.0	3.0	3.0	4.0
Q	9.0	7.8	7.5	7.2	8.6	9.0	8.1	9.6	10.6	12.2	6.9	6.4	8.3	57.0	18.0	2.5	4.3	4.4
K	9.0	7.0	6.8	6.4	8.0	9.0	8.0	10.0	10.6	11.4	6.2	8.0	9.0	35.0	30.0	1.0	4.0	4.3
VV	9.0	7.3	7.3	6.8	9.1	10.0	—	10.3	11.2	11.8	4.0L	6.0	5.0	50.0	35.0	3.0	4.0	4.2
C	9.0	7.0	7.3	6.4	—	8.8	8.0	9.7	9.9	10.4	—	7.0	7.5	102.0H	20.0	2.3	4.4	4.5
UU	9.0	7.2	7.1	7.0	8.5	8.7	8.5	9.7	10.5	11.0	5.8	5.0	6.4	40.0	60.0	4.8	2.2	3.2
BB	8.8	7.9	7.3	6.7	8.0	9.0	8.5	10.3	11.0	11.3	12.0H	12.0H	8.0	10.0	-5.0	0.0	3.3	3.5
Y	8.7	7.5	6.5	6.3	7.6	8.8	7.3	9.3	10.5	10.5	7.0	8.0	7.0	45.0	25.0	5.7	2.3	2.2
KK	8.7	7.0	7.1	6.7	8.5	9.1	7.6	9.7	10.6	11.4	4.6	5.3	7.9	20.6	28.0	2.5	3.5	3.7
R	8.5	7.2	7.0	7.0	8.0	9.0	7.8	9.5	10.5	10.5	8.0	8.0	8.0	20.0	-20.0L	2.0	3.0	3.0
GG	8.5	7.0	6.8	6.4	7.9	9.0	7.4	9.5	10.2	10.5	10.0	10.0	7.1	50.0	26.0	5.0	2.5	2.5
W	8.5	7.0	6.8	6.5	8.1	8.8	6.9	9.6	10.4	10.4	6.5	9.5	10.0	40.0	25.0	1.7	4.7	4.5
B	8.5	7.0	7.0	6.4	7.9	9.1	7.4	9.6	10.2	10.6	5.8	5.9	10.0	31.0	30.0	5.0	3.4	3.8
S	8.4	6.8	6.6	5.8	7.2	7.8	7.0	8.6	9.3	9.6	7.0	8.5	6.7	45.0	20.0	3.9	2.3	2.7
OO	8.0	6.8	6.7	6.1	7.5	8.5	7.2	8.7	10.0	10.3	6.0	8.0	4.0L	25.0	-10.0	-2.1L	6.0	6.5
QQ	7.5	6.5	6.5	6.0	7.0	8.5	6.8	9.1	10.2	9.9	10.0	10.0	11.0	95.0	55.0	5.3	3.0	2.5
LL	5.0L	3.8L	4.2L	5.5L	5.2L	5.5L	5.3L	7.4L	7.1L	6.6L	9.4	10.7	11.4H	-9.0L	18.0	3.1	-1.9L	-2.6L
JAN: AVG.	9.5	7.9	7.8	7.3	8.7	9.6	8.3	10.3	11.0	11.3	6.9	7.3	7.9	41.1	29.7	2.9	4.0	4.2
TOP10	10.9	9.1	9.1	8.4	10.0	10.8	9.4	11.5	12.3	12.7	9.1	9.6	10.0	68.3	49.1	5.2	5.7	5.9
BOT10	8.0	6.6	6.5	6.2	7.4	8.3	7.0	9.0	9.8	9.9	5.2	5.2	6.2	15.7	8.6	0.3	2.3	2.3
DEC: AVG.	9.8	8.1	8.0	7.5	9.2	10.2	8.8	10.8	11.6	11.9	6.5	6.9	7.9	39.3	30.4	2.6	—	4.3
IND.[1]	22%	31%	33%	26%	12	6%	16%	8%	12	9%	37%	40%	37%	21%	44%	—	—	—

[1] Diffusion Index: Percent of cooperators who raised their interest rate forecast from the prior month.

First Quarter 1987

Interest Rate Forecasts

Key Assumptions Behind Interest Rate Forecasts

ANALYST IDENTITY CODE	PERCENT — Short Term: 1. Prime Rate	2. Fed. Funds	3. Com. Paper 1-Mo.	4. T-Bills 3-Mo.	PERCENT — Inter.: 5. T-Notes 3-Yr.	PERCENT — Long Term: 6. T-Bonds 30-Yr.	7. Mun. Bonds 20-B	8. Corp Aaa B (Seas)	9. A Util. (Seas)	10. Home Mtg. FHLMC	Money Supply — Annual Rate-% (Q-Q Change): 11. Mon. Base	12. Money Stock M1	13. Money Stock M2	Borrowing — Annual Rate-$bil. (Q-Q Change): 14. Cons. Inst. (Net)	15. Com & Ind. Loans	A. Real GNP	B. GNP Defl. (Prices)	C. Cons. Price Index
JJ	11.6H	9.8	9.8H	9.2	9.6	10.6	9.2	11.1	12.2	12.6	4.0L	4.0L	6.0	30.0	30.0	2.0	4.5	4.5
YY	11.5	9.5	9.7	9.4H	11.0H	11.5	10.0H	12.5H	13.8H	13.4	—	6.0	9.0	30.0	25.0	-2.0L	7.0H	7.0
L	11.4	10.0H	9.8H	9.4H	10.9	11.8H	9.7	12.3	13.1	13.5H	7.5	6.0	9.0	100.0	—	4.5	3.8	4.4
J	11.3	9.3	9.1	8.5	10.1	10.5	8.4	11.2	12.3	12.7	6.9	6.1	8.6	56.4	31.2	2.3	6.9	6.1
CC	11.2	9.5	9.2	8.8	10.6	10.8	9.8	11.5	12.5	12.6	5.0	6.0	7.0	35.0	40.0	2.7	6.2	6.2
MM	11.1	9.0	9.1	8.4	10.1	11.1	9.4	12.3	13.2	13.0	10.1H	8.9	10.2	16.0	22.0	3.1	5.8	7.5H
A	10.7	9.1	8.9	8.5	9.3	10.1	8.8	—	11.2	11.4	9.0	6.1	7.7	52.0	46.4	3.8	4.7	5.0
D	10.5	8.5	8.5	8.0	9.5	10.8	9.8	11.3	11.8	12.8	—	7.0	7.5	40.0	35.0	3.5	5.5	6.0
SS	10.3	9.0	8.8	8.0	9.2	10.0	8.8	10.5	11.0	11.2	7.2	7.2	8.2	98.0	64.0	3.2	4.8	4.9
HH	10.2	8.4	8.3	7.5	8.8	9.4	8.0	10.0	10.8	11.2	—	4.8	7.6	—	45.1	1.6	4.3	4.2
G	10.2	8.7	8.5	8.1	9.2	10.2	8.6	10.8	12.0	11.9	6.5	6.8	9.7	60.0	40.0	3.5	5.3	5.2
WW	10.2	8.3	8.3	8.0	9.4	10.5	8.9	11.3	12.0	12.1	7.2	8.1	7.0	38.0	30.0	1.0	3.4	—
N	10.0	8.3	8.6	7.8	8.8	9.9	8.9	10.6	11.0	11.6	7.0	7.0	8.0	—	—	3.9	4.6	4.6
PP	10.0	8.1	8.0	7.5	9.1	10.2	9.0	10.7	11.5	12.0	6.5	7.3	7.1	55.0	35.0	3.1	4.0	4.3
ZZ	10.0	9.0	8.8	7.8	9.1	10.4	9.2	11.3	12.0	12.2	8.0	7.5	8.0	50.0	60.0	2.5	5.0	4.8
NN	10.0	8.4	8.5	7.8	9.4	10.6	9.1	11.1	11.8	12.2	5.5	7.0	7.0	25.0	15.0	2.0	4.2	5.0
E	9.8	8.0	7.9	7.5	9.6	9.7	8.0	10.2	11.0	12.3	6.5	7.0	7.9	38.0	31.0	1.5	5.3	5.5
TT	9.6	8.0	8.0	7.3	8.8	10.0	9.0	10.5	11.2	11.4	6.8	7.0	7.6	—	—	2.5	4.3	4.4
U	9.5	7.9	7.8	7.0	8.8	9.8	8.5	10.1	11.0	10.4	7.5	7.0	9.0	30.0	15.0	3.0	4.0	4.5
XX	9.5	7.5	7.5	7.0	8.3	9.2	7.8	9.8	10.6	11.2	6.0	5.5	7.5	—	—	3.5	5.5	5.5
FF	9.5	7.5	7.4	7.3	8.0	9.5	8.3	10.0	10.6	11.5	9.0	6.5	8.0	45.0	50.0	0.5	4.0	5.0
F	9.5	8.2	8.3	7.7	9.1	9.6	8.2	10.1	10.5	11.6	4.6	6.4	5.6	50.0	30.0	2.6	4.5	4.2
UU	9.5	7.5	7.4	7.3	9.0	9.5	9.0	10.2	11.0	11.4	6.0	5.2	6.6	55.0	65.0H	5.0	2.2	4.0
V	9.5	7.2	7.3	6.8	8.4	9.6	8.7	10.3	11.0	12.0	6.0	8.0	8.5	50.0	35.0	0.7	5.5	5.4
H	9.3	8.0	8.0	7.0	8.0	8.8	7.2	9.2	10.0	10.2	7.5	5.0	7.5	—	—	2.5	4.0	3.8
VV	9.2	7.3	7.5	7.0	9.2	10.0	—	10.4	11.3	12.0	6.0	7.0	6.0	60.0	40.0	3.0	4.5	4.5
RR	9.2	7.7	7.4	7.0	9.0	9.8	8.6	10.6	11.4	11.7	6.9	7.0	6.6	30.0	36.0	2.5	4.5	5.2
P	9.0	7.3	7.6	6.9	8.0	9.0	8.1	10.6	10.1	10.6	7.0	10.0	9.5	20.0	20.0	2.0	3.0	2.5
Y	9.0	7.5	6.8	6.5	7.8	9.0	7.5	9.5	10.7	10.8	7.0	8.0	7.3	50.0	25.0	3.3	2.5	2.4
O	9.0	7.5	7.5	6.8	8.0	9.4	8.3	10.0	10.7	10.8	6.0	7.0	7.0	35.0	30.0	3.0	3.0	4.0
R	9.0	7.5	7.5	7.2	8.5	9.5	8.0	10.0	11.0	11.0	8.0	10.0	10.0	50.0	0.0	4.0	3.5	3.5
Q	9.0	7.8	7.5	7.2	8.6	9.0	8.1	9.6	10.5	12.2	6.8	6.4	8.1	53.0	17.0	3.0	4.5	4.5
AA	9.0	7.4	7.3	6.7	7.7	8.7	7.5	9.1	9.9	10.4	8.0	8.0	8.0	50.0	30.0	3.6	3.5	3.5
C	9.0	7.0	7.3	6.4	—	8.8	7.8	9.7	9.9	10.3	—	7.0	7.0	108.0H	21.0	3.5	4.4	4.7
KK	9.0	7.4	7.4	7.1	8.7	9.0	7.6	9.6	10.7	11.3	4.4	5.0	6.2	17.1	25.0	3.3	3.6	3.6
B	9.0	7.2	7.2	6.9	8.2	9.4	7.4	9.6	10.4	10.6	5.3	6.2	8.5	37.0	34.0	3.5	3.9	4.0
K	8.7	6.8	6.6	6.2	7.8	8.8	7.8	9.8	10.4	11.2	6.0	8.5	9.0	30.0	30.0	1.5	4.2	4.3
BB	8.5	7.7	7.0	6.5	7.7	8.7	8.4	10.0	10.7	11.0	10.0	12.0H	8.0	15.0L	-10.0L	2.0	3.5	3.7
GG	8.5	7.0	6.8	6.4	7.7	8.7	7.1	9.1	9.8	10.2	7.0	7.0	5.6	45.0	28.0	4.0	2.0	2.0
W	8.5	6.8	6.8	6.3	7.9	8.6	6.7	9.4	10.2	10.4	7.5	6.0	8.0	30.0	30.0	1.5	4.5	4.5
S	8.4	6.8	6.6	5.8	7.2	7.8	7.0	8.6	9.3	9.6	7.0	7.0	7.5	45.0	20.0	3.0	2.7	3.0
OO	7.8	6.6	6.5	6.0	7.2	8.3	7.1	8.5	9.8	10.0	6.0	9.0	5.0L	25.0	-10.0L	1.2	6.5	7.0
QQ	7.5	6.5	6.5	6.0	7.0	8.5	6.8	9.1	9.7	9.9	10.0	10.0	11.0H	95.0	55.0	5.4	3.0	2.5
LL	5.2L	4.4L	4.3L	5.4L	5.7L	5.7L	5.1L	7.1L	6.5L	6.1L	7.2	8.3	9.4	17.0	40.0	5.9H	1.3L	-1.4L
JAN: AVG.	9.5	7.9	7.8	7.3	8.7	9.6	8.3	10.2	11.0	11.3	6.9	7.1	7.8	45.3	30.9	2.8	4.3	4.4
TOP10	11.0	9.4	9.3	8.8	10.3	10.9	9.6	11.7	12.6	12.8	8.7	9.3	9.6	74.0	50.5	4.4	6.1	6.3
BOT10	8.1	6.6	6.5	6.2	7.4	8.3	6.9	8.9	9.5	9.8	5.1	5.3	6.2	22.5	11.0	0.9	2.7	2.5
DEC: AVG.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
DIFF. IND.[1]	23%	40%	46%	37%	15	9%	20%	22%	9	3%	39%	34%	37%	23%	27%	—	—	—

[1] Diffusion Index: Percent of cooperators who raised their interest rate forecast from the prior month.

SUMMARY OF MONEY STOCK MEASURES AND CREDIT DEMAND
(Seasonally Adjusted Annual Rates)

	1985 Latest Actual Fri. 12/20/85	Average Forecasts -- Quarterly 1Q 1986	2Q 1986	3Q 1986	4Q 1986	1Q 1987
Money Stock						
11. Monetary Base	7.6%[1]	7.0%	6.9%	6.7%	6.9%	6.9%
12. Money Stock-M1	7.8[2]	7.6	7.4	7.2	7.3	7.1
13. Money Stock-M2	5.3[2]	7.6	7.6	7.8	7.9	7.8
Credit Demand Factors In Billions of $$						
14. Consumer Install. Credit	$96[3]	$53	$50	$46	$41	$45
15. Commercial/Indust. Loans	16[3]	26	27	30	30	31
Economic Indicators						
A. Real GNP (Flash)	3.2%[4]	2.9%	2.9%	2.9%	2.9%	2.8%
B. GNP Implicit Price Deflator	2.5[4]	3.6	3.7	3.8	4.0	4.3
C. Consumer Prices	4.3[5]	3.6	3.7	3.9	4.2	4.4

[1]Percent change latest 4-week average vs. 4 weeks ending 3 months earlier (SAAR), U.S. Financial Data, Federal Reserve Bank, St. Louis.
[2]Percent change latest 3 months (SAAR), Federal Reserve Statistical Release H6, Table 2.
[3]Dollar change Aug.-Oct. 1985 from prior 3 months (SAAR), BCD 112, 113.
[4]Flash percent change for 4th quarter 1985 from prior quarter (SAAR).
[5]Percent change Nov. 1985 from three months earlier (SAAR).

DETAILED DESCRIPTION OF INTEREST RATE SERIES, KEY ASSUMPTIONS AND SOURCES OF PAST DATA

Col. 1 — PRIME RATE — Charged by banks among their best-risk customers; Federal Reserve Statistical Release (FRSR) H15, G13; Economic Indicators (EI), Council of Economic Advisers, P. 30; Business Conditions Digest (BCD), U.S. Dept. of Commerce.

Col. 2 — FEDERAL FUNDS RATE — Charged on loans of uncommitted reserve funds among banks — FRSR H15, G13; BCD Series 119; U.S. Financial Data, Federal Reserve Bank of St. Louis, P. 7.

Col. 3 — PRIME COMMERCIAL PAPER — 1-month bank discount basis, rates on commercial paper placed for funds with bond rating of Aa or equivalent — FRSR H15, G13; U.S. Fin. Data, F.R.B. St. Louis, P. 6.

Col. 4 — T-BILLS 3-MONTH — Auction average (issue date) — FRSR H15, G13; EI P. 30; BCD Series 114, Survey of Current Business S14; U.S. Fin. Data, F.R.B. St. Louis, P. 7.

Col. 5 — T-NOTES 3-YEAR — Yields on actually traded issues, adjusted to constant maturities, U.S. Treas. — FRSR H15, G13; EI P. 30.

Col. 6 — T-BONDS 30-YEAR — FRSR H15, G13.

Col. 7 — MUNICIPAL BONDS — 20-bond average (tax-exempt) Bond Buyer — BCD, Item 117; FRSR H15, (New Series).

Col. 8 — CORPORATE Aaa BONDS — Seasoned (Moody's), FRSR H15, EI P.30.

Col. 9 — A UTILITY BONDS — "Estimate of the yield on a recently—offered, A-rate Utility Bond with a maturity of 30 years and call protection of 5 years; Friday quotations."

Col. 10 — HOME MORTGAGE YIELDS (NEW) — Contract interest rate on commitments for fixed rate mortgage — Federal Home Loan Mortgage Corporation; FRSR H15, G13.

Col. 11 — MONETARY BASE (ADJUSTED) — Total of member-bank reserves held at Federal Reserve Banks, cash in circulation, SAAR-U.S. Fin. Data, F.R.B. St. Louis, P. 2.

Col. 12 — M1 — A measure of funds readily available, including cash in circulation, travelers checks and checking-type accounts in banks and other financial institutions — 3 months over prior 3 months, SAAR — Federal Reserve Statistical Release, H6, Table 2; EI P. 26; BCD Series 85.

Col. 13 — M2 — M1 *plus* deposits in savings accounts, overnight RPs, money market mutual funds, etc. — 3 months over prior 3 months, SAAR, FRSR H6, Table 2; EI P. 26; BCD Series 102.

Col. 14 — CONSUMER BORROWING — *Net change* from prior quarter in consumer installment credit (in billions of dollars — SAAR) — BCD Series 113.

Col. 15 — BUSINESS LOANS — *Net change* from prior quarter in commercial-industrial loans (in billions of dollars — SAAR) — BCD Series 112.

Col. A REAL GROSS NATIONAL PRODUCT; COL. B IMPLICIT PRICE DEFLATOR; COL. C CONSUMER PRICES FOR ALL URBAN CONSUMERS —Percent Change-Annual Rate Seasonally adjusted.

BASIC SOURCES — EI = Economic Indicators, prepared for the Joint Economic Committee by the Council of Economic Advisers.
BCD = Business Conditions Digest, Bureau of Economic Analysis, U.S. Department of Commerce.

BLUE CHIP FINANCIAL FORECASTERS

American Council of Life Insurance, D.C.
Dr. Kenneth M. Wright
Aubrey G. Lanston & Co. Inc., N.Y.
Dr. David M. Jones
Bankers Trust, New York
Jay N. Woodworth
Glenn E. Burress & Assoc., Sacramento, Cal. [QQ]
Dr. Glenn E. Burress
Business Economics Inc., Chi.
Dr. John K. Langum
Chase Manhattan Bank, N.Y.
Dr. Greg Hoelscher
CM&M Group, Inc., Phil.
Dr. Lacy H. Hunt
Cycledata Corporation, San Diego [TT]
Robert S. Powers
Dean Witter Reynolds, N.Y. [E]
Arnold X. Moskowitz
Linda M. Fluegge
Drexel Burnham Lambert Inc., N.Y.
Maria Ramirez [WW]
Equitable Life Assurance Society, N.Y. [VV]
Dr. Francis H. Schott
European American Bank, N.Y. [YY]
Dr. M. Karczmar
Carol A. Stone
Evans Economics, D.C. [HH]
Dr. Michael K. Evans
FES Corp., Chicago [R]
Dr. Herbert E. Neil Jr.
The Fidelity Bank, Phil.
Jean McIntosh
First City Bancorporation, Houston
Michael Baruschke
First Interstate Bank, L.A.
Dr. A. James Meigs
First National Bank of Boston [PP]
Dr. Wayne M. Ayers
First National Bank of Chicago, Chi.
Dr. Roy E. Moor
First National Bank of Minneapolis
Paul Anderson Anton
GTE Corp., Stamford
Dr. Daniel A. Hodes
Harris Trust and Savings Bank, Chicago [N]
Robert Genetski
Industrial Chemical Economist, Midland, MI [LL]
Dr. Martin S. Frederixon
LaSalle Consulting Inc., Chi. [JJ]
Dr. Jon F. Frye
LaSalle National Bank, Chi. [AA]
Dr. William W. Tongue
Manufacturers Hanover Trust, N.Y.
Dr. Irwin L. Kellner
Marine Midland Bank, N.Y. [A]
Dr. Albert E. DePrince Jr.
Merrill Lynch, N.Y. [DD]
Robert A. Schwartz
Metropolitan Ins. Companies, N.Y.
Robert H. Vatter
National Association of Realtors, D.C. [KK]
Dr. Jack Carlson
National City Bank of Cleveland [SS]
Dr. Theodore H. Tung
Oliver Jones & Associates, D.C. [OO]
Dr. Oliver Jones
Pennzoil Company, Houston
Linda F. Condit
Larry Fiala
Philadelphia National Bank, Phil. [G]
Dr. A. Gilbert Heebner
Prudential Bache Securities, Inc., N.Y. [Y]
Dr. Edward E. Yardeni
Deborah Johnson
Prudential Ins. Co. of America, Newark
Dr. Michael W. Keran
Rainier National Bank, Seattle [ZZ]
Douglas H. Pedersen
Rinfret Associates, N.Y. [JJJ]
Dr. Pierre Rinfret
Kenneth McCarthy
Sanford C. Bernstein & Co., N.Y. [L]
David A. Levine
Schroders, Inc., N.Y. [S]
Aubrey Zaffuto
Sears, Roebuck & Co., Chicago
T.E. Swanstrom
William D. Toal
Security Pacific National Bank, L.A.
Dr. Kathleen M. Cooper
Standard & Poor's Corp., N.Y. [B]
Dr. David M. Blitzer
State University of N.Y., Binghamton [GG]
Dr. Richard W. Nelson
U.S. Chamber of Commerce, D.C. [O]
Dr. Ronald D. Utt
U.S. Trust Co., N.Y. [U]
Dr. Thomas W. Synnott III
Valley National Bank, Phoenix [EE]
Dr. Elliott D. Pollack
Wells Fargo Bank, San Francisco [W]
Dr. Harold C. Nathan

ANALYST IDENTITY CODE — Many members of the financial forecast panel have asked that their forecasts remain anonymous. They are identified by the same letters in each issue, however, so readers can track each forecaster over time. Several forecasters have agreed to let us use their names, and their code letters are in brackets following the company name in the forecasters' list on page 6.

Computer Programming provided by the Economic Outlook Center, College of Business, Arizona State University, Tempe.

SPECIAL QUESTIONS:

I. What are the three major factors that will help LOWER interest rates during the year ahead?

	Blue Chip Rating[1]		
	Average[2]	16 Expecting Lower Rates	18 Expecting Higher Rates
1. INFLATION STABILITY—Wage gains to be moderate	7.2	7.8	6.9
2. PROGRESS ON LOWERING FEDERAL BUDGET DEFICITS—Clear-cut evidence that Congress and the White House will reduce spending and possibly raise taxes.	6.0	6.3	5.9
3. SLOWING OF RECOVERY WILL REDUCE DEMAND FOR FUNDS—Borrowing by both consumer and business to decline from high levels as recovery slows	5.0	5.6	4.2

4. OTHER FACTORS LARGELY EMPHASIZED BY THOSE EXPECTING LOWER INTEREST RATES: Further easing of Federal Reserve monetary policy, strong deflationary pressures including, sharp drop in oil prices, continued pressure to lower the value of the dollar.

II. What are the three major factors that will help RAISE interest rates during the year ahead?

	Blue Chip Rating[1]		
	Average[2]	16 Expecting Lower Rates	18 Expecting Higher Rates
1. ECONOMIC RECOVERY STRONGER THAN EXPECTED—Would accelerate inflation fears	6.2	5.4	7.0
2. RENEWED INFLATION FEARS—Rate of price increases greater than expected would result in Fed tightening money.	5.7	5.0	6.4
3. SHARP WEAKNESS IN VALUE OF DOLLAR—Would increase exports and lower inflow of foreign funds	5.3	3.8	6.2
4. FEDERAL BUDGET DEFICITS—Prospects for even further growth in government borrowing.	4.9	4.5	5.6

5. OTHER FACTORS LARGELY EMPHASIZED BY THOSE EXPECTING HIGHER INTEREST RATES: Stonger-than-expected corporate credit demands, more conservative Federal Reserve policy to head off renewed inflationary pressures and stock market boom, sudden financial shocks including foreign loan defaults and major bank failures.

[1]Rating scale: +1, of little importance; +5, so-so; +10, of highest importance.

[2]Sample totaled 43 forecasters. Of the 43, 16 expected lower rates; 18 expected higher rates; and nine expected relative stability in interest rates throughout the period.

Options and Futures: New Route to Risk/Return Management

Options and Futures: Strategic Tools for Portfolio Management (Part I)

Robert W. Kopprasch, CFA

My presentation includes comments applicable to both fixed income futures and options, as well as some discussion regarding contract pricing, how contracts are traded on the exchanges, and the function of margin. Many of the principles presented can also be applied directly to the equity side.

The fixed income market has been characterized by a very active cash market. While perhaps not as visible as the equity market because it is an over-the-counter, dealer-traded market, many billions of dollars worth of securities are traded every day.

In 1975, futures trading on GNMA contracts began and several additional futures contracts were added shortly thereafter. More recent developments include options on the cash market and on futures. At present, the most actively traded fixed income option contract is an option on bond futures (Figure 1).

In December 1980, the Kingdom of Sweden issued a bond with warrants that allowed the purchaser to buy another bond, as opposed to the traditional right to exchange the warrant for common stock. This was the first true bond option, with a six-month life. As it turned out, the option expired worthless. By 1982, we had exchange-traded options on bonds and options on futures. So, a number of developments have changed the way both asset and liability managers can manage their portfolios.

Motivation to Use Future/Options

What is a futures contract? A futures contract is a legal commitment to buy or sell a security. The instrument provides for the holder to either take delivery or make delivery of a security at some date in the future, much like a forward contract. The price is essentially determined today, as in any forward trade in the bond market.

One of the most important features of futures contracts is the offset capability. Typically, when you enter into a contract and want to get out of that contract, you have to negotiate with the other original party. The futures market has a mechanism that allows you to offset your position by doing a reversing trade. This is very important for hedging and for a number of other applications.

There are now a number of actively traded futures contracts in the fixed income market: U. S. Treasury bills and bonds, GNMA's, CD's, Eurodollar deposits, and U. S. Treasury notes. So, there are a number of places on the yield curve and several different credit qualities for which you can utilize futures contracts.

Why do we use them? We can use them as an alternative investment. We can buy futures instead of buying bonds. We can construct combinations of cash and futures that look like money market instruments. We can use futures to hedge interest rate risk. There are also any number of arbitrage possibilities.

Figure 1

The Expanding Long-Term Debt Market

PRE-1975	1975	1977	1980	1982
Bonds	Bonds	Bonds	Bonds	Bonds
	GNMA Futures	GNMA Futures	GNMA Futures	GNMA Futures
		Treasury Bond Futures	Treasury Bond Futures	Treasury Bond Futures
			Bond Warrants	Bond Warrants
				Options on GNMAs and Treasury Bonds
				Options on Futures Contracts

We won't discuss arbitrage in depth because it can get very complicated, but we will discuss arbitrage in the pricing sense because it has a major impact in terms of why the contracts are priced as they are.

Typically, at least on a retail level, the motivation for using *equity* options is to employ leverage or to limit loss. In the fixed income market, however, leverage was available before options became available. In the futures market, or by using margin, government securities can be purchased with only 5 or 10 percent down. There is a lot of leverage available without options.

There are several reasons for considering the use of fixed income options that are very different than the reasons for using equity options, for instance, when certain commitments made by an institution or corporation are tied to interest rates. These might be mortgage commitments, some sort of a forward market in which you've committed to take down some securities, or an insurance company that bids on a guaranteed investment contract (GIC) but doesn't receive the funds until some time in the future. These commitments are all tied to interest rates. A second situation involves foreign investors who can take a position in U.S. interest rates by using fixed income options (or futures) with very little currency exposure. Finally, market volatility can be exploited by using options, which cannot be done with futures or just the cash instruments.

Participants and Exchange Operations

The participants in futures markets are essentially everybody: hedgers, broker-dealers, and speculators. Who are the hedgers? They include corporations, mortgage bankers, commercial bankers, insurance companies, pension funds, bank trust departments — anybody with assets or liabilities that have a value related to interest rate fluctuations. Regulatory climates have changed over the last several years, making it far easier for some types of users to enter the market directly.

The clearing house operation of the futures exchanges is something that is unique to futures and options and it does not have a corollary in the normal equity market. It does have a parallel in equity options but not on the stock exchange, per se. Consider the following scenario.

Client A comes to his broker and says, "I'd like to buy a futures contract," and that order is routed to the trading floor. Let's say it is at the same time that Client B directs an order to the exchange floor. So Broker A and Broker B come to the pit on the exchange floor, there is some discussion on the pricing of the contract and a long and short position is established for the respective parties.

At that moment it appears that Client A and Client B have obligations to one another. But, as they settle these trades, the clearing house becomes the "other party" to every trade. It steps into the middle of this trade and takes on an obligation to Client A. Since Client A bought the futures contract, the exchange says, "We are ready to obtain delivery if you want." To Client B, who sold the contract, the exchange clearing house says, "We will take the securities if you are short in the end and we will make sure that you get paid for those securities." So, the exchange clearing house becomes the other party in every trade. This is very important because of the offset capability it provides. Client A doesn't have to find Client B in order to get out of this contract. He simply goes back through the exchange clearing house, does a reversing trade, and the position is wiped off the books.

The result of the clearing house role is financial integrity. It has been fairly well publicized that, while people can lose a lot of money in the futures market, nobody loses money because of a default on the futures contract. Observing the trading on the exchange floor, it is very difficult to understand how they can reconcile any trades by the next morning before trading begins again. There are traders buying and selling who simply tear the pages from their pads as they close a transaction and throw them over their shoulders to their runners. The runners grab the papers from the air or from the floor and run them back to the desk to make sure that a confirmation is initiated. It is mind-boggling that this market can work, but billions of dollars in Treasury

bill and Treasury bond futures are traded on it every day.

Margin

Although margin seems to be an inconvenience to just about everybody who trades futures, it is a very important factor. You wouldn't want to engage in a transaction for forward delivery with someone on the other side when you have no idea about their credit. In fact, you don't even know the identity of the other party the way the market is structured. So, you don't want them to have a large obligation to you.

Margin prevents disaster. The *initial* margin is put up essentially as a safeguarded deposit just to show that you have some cash and can stand up to a couple days of losses in the futures market. *Maintenance* or *variation* margins come about as the markets move. Rather than let a large profit or loss develop, gains and losses are marked-to-market every day. It doesn't count for tax purposes, but in a cash sense futures leave no unrealized gains or losses. It is as if all trades are liquidated every day at the closing price and then opened up the next morning at last night's closing price. You are always "flat" in the futures market. Large losses cannot develop as you don't owe anyone money after you settle up on the margin and they don't owe you anything. This protects the integrity of the market and eliminates the possibility of not being able to complete a trade because of an inability to execute on the part of the other party.

Contract Specifications

It is very important that you get involved with contract specifications if you intend to trade in the futures market. Treasury bond futures are one of the more complicated; GNMA's are even worse. Some of you may have seen a *Forbes* article recently about delivery problems of GNMA's. You need to know the details of the contract specifications to operate effectively.

Treasury bonds can be delivered on virtually any business day during the delivery month. If you are short the contract (that is, you will be delivering securities), you pick the delivery time. Suppose December is the delivery month. You can deliver on December 2, December 17—or on most other days during that month. You can also pick the specific bond to be delivered. Will it be the 9-1/8's, 10-3/8's, 12's, or 14's?

You get to pick. The party with the long position on the other side does not know how much cash he is going to have to come up with to take delivery, or when he will get delivery. Only a notice a day or so in advance of the delivery date will enable him to figure out how much cash he will need.

As you can see, you have to learn the contract specifications before you can trade the market. It sounds fairly obvious but inattention to some of the details of the contract specifications have left some people very sorry.

Pricing

Pricing is an aspect that has applications both to the fixed income and to the equity sides. Let's look at the pricing of a U. S. Treasury bill futures contract. Such contracts simply call for the delivery of a 90, 91 or 92-day bill. Let's assume it to be a June 15 bill. Let's also assume that we can sell a three month futures contract that requires the delivery of a three-month bill if we hold the position to delivery. If in December we sold a March futures contract, which requires delivery of the June bill, three months from now when the March futures contract goes to delivery, the June bill will be the deliverable bill. We can simply deliver it as the required security. We know what the six-month bill costs us today, so we have a known purchase price. When we short the futures contract, we are essentially selling that bill forward at a known price. With a known purchase price and a known selling price, we have both a known dollar and percentage return over the three-month period.

What if that return were 12 percent? Everyone would do this trade. That would be the best three-month return that is available and it would invite arbitrage. However, it never gets to 12 percent in this kind of an environment. One of the major aspects of futures pricing is that you don't price the futures contract on expectations. The three-

month contract is not priced based on where people think three month rates will be in March, except insofar as that is already taken into account in the yield curve and the forward rate curve based on this simple arbitrage. Knowing that one can create a three-month instrument today should create a competitive three-month rate of return.

Table 1 shows an example where Treasury bills due June 14, 1984 on a trade date of December 13, 1983 were selling at a discount quote of 9.15%. The bill could be purchased at that rate. The futures contracts that go to delivery on March 15, 1984 had a quote of 9.48%. Buying the six-month bill and selling the futures contract with the proper ratio, upon delivery the CD (certificate of deposit) rate of return would be 9.26%.

The returns can be determined by Treasury bill math. It is easy if you know the 9.15% discount to come up with the price of a six-month bill of 95.323. Based on a futures price of 9.48% you can come up with a selling price of 97.604. There is a holding period of 93 days (184 - 91), so you simply take a purchase price of 95.323, a selling price of 97.604, and turn that into a CD return of 9.26%. The type of arbitrage employed would depend upon the rate. The return should generally be between the three-month bill rate and the three-month repo rate.

There is no specific rate of return on a "cash and carry" T-bill transaction. The full faith and credit of the U.S. government is not behind this three-month instrument. You have bought a six-month bill and sold the last three months to someone else. You do have the credit of the Clearing Corporation, but that is clearly not the same as the government's credit. So the rate should be higher than the rate available on bills. Yet, the contract is more liquid than repurchase agreements, so the rate should probably be somewhat lower than the rate on repos. Typically, the rate will fluctuate back and forth between the repo rate and the Treasury-bill rate. Getting a little more complicated, let's look at bonds.

Assume that on December 13, 1983 we buy U.S. Treasury 12's of 2013 and sell the futures that require delivery of that bond on March 21, 1984. We know the bond's quoted market price and what we have to pay in accrued interest on the purchase. We also know the selling price based on the bond futures contract, and the amount of accrued interest we will receive when we deliver the bonds.

Collectively, this information gives a known capital return including the change in accrued interest and also any coupons that might be received in the interim period. Thus, we can calculate a guaranteed 6.04% return over a short-

Table 1

CBT T-Bill Cash & Carry with 6/14/84 T-Bill

Cash Purchase Price = 9.15 discount Settlement for Cash: 12/13/83

[1] $ Discount = 9.15 x 184/360 = 4.676667 12/13/83 to 6/14/84 = 184 days

[2] Price = (100 - 4.676667) = 95.323333

[1] $ Discount = 9.48 x 91/360 = 2.396333 3/15/84 to 6/14/84 = 91 days

[2] Price = (100 - 2.396333) = 97.603666

CD equiv. return: (97.603666/95.323333 - 1) x 360/93 = 9.260%

term period. Contrary to the Treasury bill example, this return may not appear to be competitive. This is due to all of those delivery options mentioned earlier with regard to the short, that is, whoever has sold the bond futures contract has the right to select what and when to deliver. And, there is also what they call the "every afternoon put." The futures market closes at about 3:00 p.m. and the settlement price is determined at that time. But the cash market continues to trade.

If you are long in the cash market, have shorted the futures and promised delivery, and the cash market falls drastically in the afternoon, you can still deliver at the 3:00 p.m. settlement price on futures. That opportunity is especially valuable on Thursdays after the money supply announcements are made. It is also valuable owing to some rationing that is necessary because of the way the contracts are structured. Usually, you are short more contracts than you own pending delivery.

In addition, there is a so-called "wild-card" period in bonds. About a week before the end of the month, the bond futures contracts stop trading, but the final delivery date is still one week away. The party that is short has a full week to determine when and what will be delivered. This can become a very valuable option.

In the example depicted in Table 2, the March bond contract is trading at a price of 69 18/32. If we were to buy the bonds to sell on March 21, we would have paid 100 22/32. Based on the conversion factor, we would be delivering them at about 99 4/32. It may seem ridiculous to buy the bond over par and sell it at that much of a discount, but the bond is carrying a 12 percent accrual rate in a 9 or so percent environment. With this income accrual a little bit can be given up in price and a reasonable return still achieved.

If there is no spread at delivery and the bond is simply delivered, the worst return possible is 6.04 percent. That is, if none of the delivery options become valuable, this is the absolute floor return.

The data in Table 2 show how the floor return is calculated. Buying the bonds with interest that has accrued, the cost is $104,600. In February a $6,000 coupon is received because this is a February/August bond. The coupon is then reinvested at a 9 percent rate for 35 days to earn $51.78. Adding the $1,154 accrued interest to the $99,133 selling price, the selling proceeds are $100,287. Annualizing the total profit of $1,738 over the cost of $104,600, and using a 99-day holding period gives a 6.04 percent floor return.

It is crucial in futures to understand this "cash and carry" pricing relationship. If it were not for the delivery options on the bond contract, the cash and carry return would be a competitive three-month return. It becomes very important to understand that when thinking about hedging. For example, it is a common misconception that you can buy a long Treasury or a corporate bond, sell futures against it to protect the price, wind up earning the 12 percent return on the bond and still protect the price. This means getting a long-term rate for a short-term period. It simply can't be done. Proponents of this theory do not understand the forward rate curve. They do not understand, as the figures in Table 2 indicate, that while you buy the bond at 100, when it goes to delivery, you deliver at 99: the price loss (or gain if the yield curve is inverted) combines with coupon income to give you the short term rate.

Futures Applications

Let's now examine briefly futures and options applications. The previous application involved a thirty-year Treasury bond that was turned into a three-month investment. Obviously, the risk characteristics of the securities that are available can be changed. Similarly, the duration of a portfolio can be modified and increased beyond what seems reasonably available in the market by buying futures.

Duration is in one sense a measure of volatility. In a futures contract with no real investment up front, you are just adding volatility to the portfolio or selling it off. In the example, a 12 percent bond due in 2013 was modified to an instrument having a duration very close to three months.

Table 2

CBT T-Bond Cash & Carry with US Treas. 12's of 8/15/13

Cash purchase price	= 100 22/32	Settlement for purchase:	12/13/83
Futures price	= 69 18/32	Settlement for futures delivery:	3/21/84
Conversion factor:	1.4251	Days from settlement to maturity =	99

[1]	Buy Govt for 100 22/32 =	100,687.50	principal
	on 12/13/83	3,913.04	accrued
		104,600.54	
[2]	Receive coupon of 6,000.00 & reinvest for 35 days at 9.00% bond equiv. on 2/15/84		
	6,000.00 x 0.09 x 35/365 =	51.78	
		6,000.00	
		6,051.78	
[3]	Sell Govt for 69 18/32 =	99,133.52	
	x 1.4251	1,153.85	— Interest accrued Feb 13 to Mar 21 or 35 days
	99.133519	100,287.37	
[4]	Total Profit: 100,287.37		
	6,051.78		
	-104,600.54		
	1,738.61		
[5]	Breakeven repo rate:		

$$\frac{1{,}738.61}{104{,}600.54} \times \frac{360}{99} = 6.04\%$$ CD return

A second use of financial futures is the ability they give to pre-invest. That is, you can buy now and lock into today's (forward) rates or today's (forward) prices. Pre-investing might involve forward GIC commitments, pension fund contributions, or market timing decisions. A number of insurance companies have been using forward transactions in order to accomplish a protection goal. That is, they will get a quote on a Treasury bond for delivery in February where the pricing is determined almost exactly the same way. We (Salomon Brothers) buy the bond and finance it for three months. If there is a financing profit we give that back, if there is a financing loss we charge for it. So the "carry" is built in just as it is with futures contracts.

Financial futures can also be used to hedge assets. This use might seek to minimize fluctuations of market value to assume a defensive market posture, or to earn a short-term rate plus a long-term spread.

Futures offer market liquidity. Millions of dollars worth of securities in the futures market can be transacted without adversely affecting the price, something that can't be done in the corporate market, or even in the government market, quite so quickly. Volume in the bond futures market is greater by a substantial margin than volume in the cash market. If you have $30 million worth of securities that you'd like to get rid of quickly, you may not be able to go into the cash market and do it right away. But, you can sell a surrogate for it in the futures market. Futures allow you to implement your *timing* decisions before you have made your *selection* decisions.

Futures can be used to modify duration, whether in an immunization or a contingent immunization mode. If you want to back up a shorter GIC with

longer securities you can modify the duration in futures, changing its risk characteristics. Or, you can go out and buy bonds that have desirable coverage, sinking fund, call features, and maybe attractive spreads and use futures to modify the duration instead of buying bonds that have the necessary durations, but otherwise less desirable characteristics.

Finally, I'd like to talk about earning a short-term rate and a long-term spread. What we looked at before involved owning a 12% Treasury bond and shorting the proper number of futures contracts to give us the short term rate. Suppose that instead of owning Treasury 12's, you owned a corporate security earning a spread over the 12% Treasury rate, and shorted futures contracts. If there was no change in spread over the horizon, you could assume that you would earn the short-term rate plus the spread over a long government.

However, spread changes over the horizon can influence your return drastically. A number of insurance companies that had expected a *long-term rate* and the long-term spread have found that the *short-term rate* plus the long-term spread is what they earned. As the spread narrowed over the last year, many of them had absolutely fantastic returns, but they then found themselves unable to continue earning that sort of return. For a while it looked like futures were working magic on their portfolios; now, reality has taken over.

Uses for Fixed Income Options

We are going to look at fixed income options somewhat differently. A number of institutions have options in their products. Maybe they didn't realize it, or perhaps for years those options weren't terribly valuable and didn't come back to hurt them very much so they aren't too aware of them. Given the right circumstances, however, these options become very visible.

A life insurance policy that says you can borrow at 8 percent is very valuable in this environment. They don't have such terms too often anymore. That right to borrow is a "put": you have the right to give them an 8 percent security and they have to give you "par" for it. They have to give you the full value, so being able to borrow at a fixed rate is essentially owning a put. The insurance company in that case has *granted* a put. (I would usually say "sold" a put, but there is no explicit fee for the option when it is embedded in an insurance policy.)

Could they use the options market to see just what they are giving away? Could we use the options market to see what those puts are worth? The answer is "yes" to both questions. We can buy options to offset those granted in a product. It is possible to combine the option granted with other options to alter the risk profile. And, via options, we can buy or sell volatility without regard to market direction.

Figure 2 is an "options" balance sheet put together for an insurance company. There is an asset side and a liability side. The interior of the figure shows the options held by the insurance company and those it has granted. On the asset side the insurance company may hold bonds with puts, or bonds that are extendible, or bonds with warrants. These are all options that they own. Far more important to the insurance company on its asset side are those options they have granted. They may own bonds that are callable. A number of insurance companies holding high-coupon GNMA's are finding out how expensive that option is to their return. The issuer, in a sense, is not GNMA but the individual homeowner who has the right to prepay that mortgage at any time, that is, has the right to call it in.

The liability side is what hurts the insurance companies most. Included are policy loans, cash value surrenders (regardless of what has happened in the market), single premium deferred annuity (SPDA) cash-ins, and guarantees involving the higher of the short or long-term rate. A period rate guarantee occurs where they offer a rate and say, "for any money we take in during the next year we will give you," say, "12 percent."

Some of these options are absolutely unhedgable (and the rates offered sometimes appear unattainable). However, they are certainly options that have been granted and maybe the options

Figure 2

The 'Options' Balance Sheet

	ASSET SIDE	LIABILITY SIDE
Held By Insurance Company	o Putable Bonds o Extendible Bonds o Bonds With Warrants o Floating Rate Preferred At 'Higher-Of' Yields	o Dividend Distribution
Granted By Insurance Company	o Issuer 'Call' o Sinking Fund Double-Up Option o Mortgage Prepayments o Implicit 'Put' Option In Forward Commitment Process	o Policy Loans o Cash Value Surrender o 'SPDA' Cash-In o 'Higher-Of' Guarantees o Period Rate Guarantees

market can be used to alter the risks. In fact, we can buy puts or calls to offset some of them. For example, if we own high coupon GNMA's, we know that the prepayment rate will go way up and our return will be hurt if there is a market rally. By buying calls, we get an offset to this because our calls will become more valuable if the market rallies. Actually, there are several ways of offsetting the option commitments that insurance companies have. The direct offset method is, for example, if you have sold a call, buy a call. Another method is to combine several types of options, as in the following example. An insurance company came to us and said, "We have a mortgage commitment out there for a five-year mortgage at a 14 percent rate." (We'll forget spreads in this example). "At the same time we have guaranteed a fourteen percent rate on a forward GIC. We will get the money in three months and we expect the mortgage commitment will be taken down."

Looking only at the mortgage commitment, they had a short position in a put. The first assumption would be that they should buy a put to protect themselves. But after looking at the whole situation, they also had a forward GIC and wanted to have that 14 percent mortgage on the books to generate the income to pay the GIC. It turned out that adding a call option was the thing to do in this portfolio. They bought a call option on a five year Treasury, an over-the-counter option. That left them neutral with regard to interest rate risk. If rates rose, the holder of the mortgage commitment would in fact come and borrow the money because alternate sources would be much more expensive. Thus, they would get the money (GIC) and the investment (mortgage) that they needed to pay the cost of the GIC. On the other hand, if the rates declined the mortgage borrower could be expected to go elsewhere.

After a rate decline, let's say the insurance company can only invest at 12 percent instead of 14 percent. A properly ratioed (structured) position will give enough profit on the call option in a market rally (bringing rates from 14 to 12 percent) to offset the decline in income. So there are ways to combine options that may not be as direct or obvious as others.

Other Key Factors

Looking now at some other aspects of the subject, there are exchange-traded options on cash bonds, notes and Treasury bills, and options on bond futures. These futures options are the most active options. There are, in addition, options that you can buy from government securities dealers who are willing to take on the risk of being in a short-option position. These options are advantageous in several ways. For example, you could buy an option on a five year Treasury note, something you can't do in the exchange-traded market. You could have it expire three weeks later if you wanted, or a year later, or two years later, and you could set up the strike price to provide whatever kind of insurance you wanted.

Specialized options can also be developed. One example we've offered is an option on the yield curve that pays off if the spread between short rates and long rates exceeds a certain amount. This particular option is used to hedge against the kinds of products where the customer has been guaranteed the higher of two different rates. Other examples could be given.

To close, I want to take a look at hedging a short-term liability. Futures contracts are often misunderstood because some academic literature, some brokerage literature, and even some literature coming out of the exchanges themselves have shown examples of perfect hedges lasting for years. In these unfortunate examples, whatever happened in the cash market was exactly mirrored in the futures market, so you could always lock in *today's* cash rate. That simply isn't so.

Looking at an example where a bank is hedging a short-term liability, we will simplistically assume for a minute that we are able to issue right at the Treasury bill rate. Adding a spread to that doesn't affect the analysis at all, except to change our target rate by the amount of the spread. So, we will just forget the spread and say that banks have the right to sell three-month money market certificates and can price them right at the Treasury bill rate. How can they lock in that rate? What is their *target rate*? How can they do any financial planning?

Let's take a look at the situation on the hedge initiation date when Treasury bills are trading at 8 percent and futures are trading at 10 percent. This is admittedly a very large spread. If we sell the futures contract, we have a liability in the future that we know we are going to have to sell. Money market certificates that are out there today will come due about that time. We want to roll those over, but we want to lock in today the effective rate to the institution on that roll. We sell the futures contract at 10 percent. As time goes on we find that on the futures delivery date - which corresponds to the date we are going to take off the hedge and roll our money market certificate - the Treasury bill rate is 12 percent. The futures rate has to converge to the cash Treasury bill rate here because a day or so before delivery there would be a great arbitrage at that rate if it didn't converge. So futures and cash are both at 12 percent.

What has happened? We have to issue our security at 12 percent but we have a 200 basis point profit in our short position. We sold a Treasury bill contract at 10 percent for 90 and it has gone to 88 (12%) the way it is quoted. We made 200 basis points on that trade. So, when we take that 200 basis-point profit away from the cost of our issue at 12 percent, we wind up with an effective rate of return of 10 percent. This corresponds to the rate on the contract when we first shorted it; the effective rate is exactly where we sold the futures contract. If we could always set up our hedges to be taken off on futures delivery days, and if our liability rate were tied directly to bills, we could guarantee that our hedges would be this effective all of the time. Many people would look at hedging effectiveness and say that winding up with an effective rate of 10 percent after an 8 percent rate originally prevailed in the spot market is terrible. In fact, it is determinable beforehand that your target is 10 percent, not 8 percent. The cash rate on the day you sell the contracts has nothing to do with the target rate for that hedge.

The corollary would be in the long-term bond case considered earlier. We were not locking in a cash price of 100 22/32 on 12 percent Treasuries. The pricing was, instead, set up to give a short-term rate of return. The arbitrage says this is a fair price. But more importantly, this

kind of situation will result in an effective rate equal to the futures rate. So believe the futures market when it tells you what rate you can lock in, but don't think it's the cash rate.

There are three important facts to remember about pricing and hedgable yields. First, futures prices have an impact on hedges, and the yield curve essentially sets futures prices. Second, very few hedges will appear perfect unless the correct target is used to determine effectiveness. Finally, yield curve pricing constrains most hedges of long-term assets to earning a short-term earnings rate.

Note (1) If purpose is protection against rising interest rates, sell a fixed income futures contract. If interest rates rise, money made when covering short position will at least partially offset loss on long position that occurs as interest rates rise.

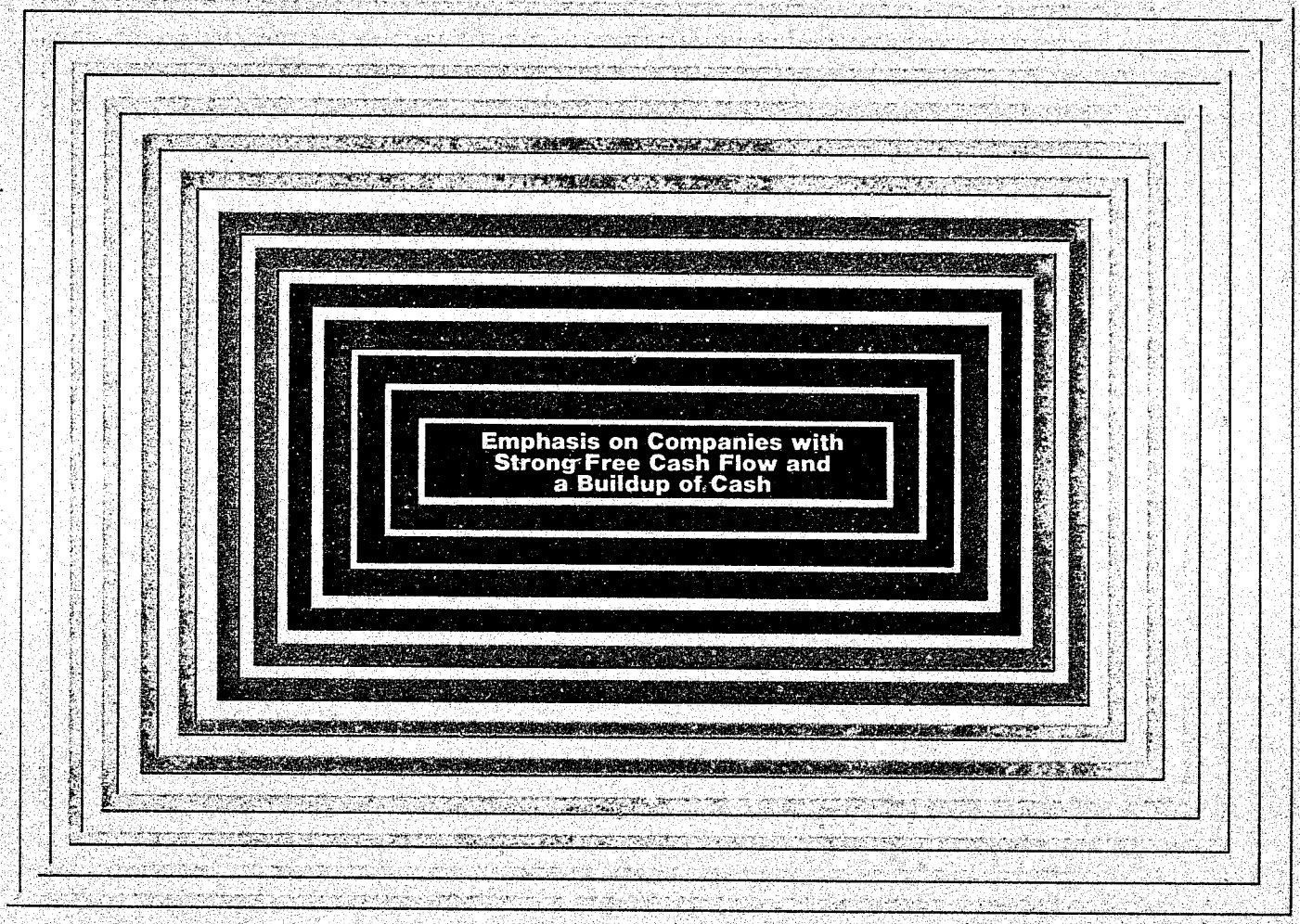
(2) If purpose is protection against falling interest rates e.g. you hold GNMA's and know lower interest rates will lead to early repayment of principal, buy call option i.e. option to buy a security. Then if interest rates fall, market prices will increase and value of call options will increase. Profit on call options will partially offset losses due to inability to reinvest high levels of principal repayments at earlier GNMA yields.

Merrill Lynch

Quantitative Analysis

November/December 1985

Common Stock Valuation
A Bimonthly Report



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Company	Decile Rank: Alpha	Decile Rank: ML vs. Consensus	Decile Rank: Relative Strength	QRQ	Detailed Alpha Analysis: Implied Return %	Req. Return %	Beta	Alpha %	Std. Alpha Decile	Implied Return Assumptions: Proj. 5 Year Growth Rate: EPS %	DPS %	Steady-State: Years	EPS Growth %	Pay-out %
Olsten	7	4	1	1-1	13.6	14.5	1.1	-.9	8	20.0	9.2	10	12.0	25
Oneok	3	7	8	3-3	13.8	12.5	.7	1.3	3	8.3	6.0	12	5.6	60
Orange/Rock Util	5	8	5	3-3	12.2	11.6	.5	.7	4	5.7	5.0	9	4.0	65
Outboard Marine	3	4	10	2-2	15.0	13.4	.9	1.6	3	12.0	16.4	11	8.0	55
Overnite Trans	10	6	5	3-2	12.0	15.1	1.2	-3.2	10	10.0	12.8	15	8.0	55
Owens–Corning	6	2	5	2-3	14.9	15.2	1.3	-.3	7	12.0	16.9	12	9.0	40
Owens Illinois	9	3	2	2-2	11.4	14.2	1.1	-2.8	9	5.6	7.0	12	7.0	50
Oxford Inds	10	7	6	2-2	10.4	14.0	1.0	-3.5	10	12.0	12.0	15	8.0	35
Ozark Holdings	4	10	1	4-4	15.5	14.6	1.1	.9	5	18.3	21.7	24	9.5	45
PHH Group	10	2	3	3-1	12.6	16.5	1.5	-4.0	10	12.0	14.7	15	8.0	50
Pnc Financial	5	1	4	1-1	14.7	14.4	1.1	.3	5	13.0	11.6	15	10.0	32
PPG Industries	6	9	2	3-2	14.1	14.4	1.1	-.2	6	16.6	10.0	11	7.0	50
PSA Inc	4	6	4	4-4	14.5	13.4	.9	1.1	4	16.7	.0	24	9.5	40
PACCAR Inc	7	8	8	4-3	13.7	14.1	1.0	-.5	7	10.0	11.9	16	7.5	45
Pacific Gas&Elec	2	6	5	3-3	13.6	11.4	.4	2.2	1	3.3	3.8	8	4.2	65
Pacific Lighting	7	10	4	3-3	10.9	11.7	.5	-.8	7	4.1	7.0	12	3.8	70
Pacific Telesis	5	4	6	3-2	13.4	12.8	.7	.7	4	8.3	6.9	10	6.0	60
Pacificorp	5	6	3	3-3	13.0	12.7	.7	.2	5	6.2	4.4	12	4.1	65
Pall Corp	8	4	5	1-1	13.5	14.7	1.2	-1.2	8	20.0	14.3	18	9.0	40
Pan AM Corp	8	1	1	4-4	13.4	14.4	1.1	-1.0	8	14.9	NA	18	8.6	40
Pandick	9	3	10	2-2	15.2	17.5	1.7	-2.3	9	16.9	19.7	15	15.0	15
Panhandle East	9	10	6	4-3	12.7	14.8	1.2	-2.0	9	5.7	5.0	18	7.0	60
Parker Drilling			10	DEX			1.2							
Parker Hannifin	9	10	9	3-1	13.4	15.7	1.4	-2.4	9	12.0	7.5	14	8.0	45
Pay N Pak Stores	1	7	7	3-2	17.6	14.0	1.0	3.6	1	13.9	11.4	18	8.0	50
Payless Cashways	1	9	10	3-2	18.8	15.9	1.4	3.0	2	30.8	34.3	18	9.0	50
Penney J.C.	2	6	5	3-2	13.9	12.0	.6	1.9	2	9.5	11.7	14	7.5	50
Pennsylvania P&L	6	7	6	3-3	11.3	11.6	.5	-.4	6	-1.0	.0	8	4.0	65
Pennwalt Corp			6	RVW			.9							
Pentair Inc	3	9	3	3-2	14.5	13.1	.8	1.4	4	14.0	8.9	12	10.0	35
People Express			2	DEX			1.0							
Pennzoil	4	9	4	3-2	15.7	14.7	1.2	.9	4	13.0	4.9	15	13.0	50
Peoples Energy	7	3	6	4-3	13.0	13.7	.9	-.7	7	4.0	4.0	11	3.0	65
The Pep Boys	4	5	1	2-1	14.9	14.1	1.0	.8	5	18.5	25.1	25	12.0	35
Pepsico	2	2	1	2-1	13.5	11.6	.5	1.9	2	15.0	12.0	18	10.0	40
Perkin Elmer	1	6	7	3-1	22.9	16.4	1.5	6.5	1	56.0	19.9	10	10.0	40
Petrie Stores	4	6	3	2-3	13.9	12.9	.8	1.0	4	14.0	10.0	17	8.0	65
Petrolite	4	8	9	3-3	13.9	12.9	.8	1.0	4	9.9	11.2	20	9.0	50
Pfizer	5	6	3	3-2	13.6	13.3	.9	.2	5	14.0	12.7	30	8.0	50
Phelps Dodge			3	DEX			1.6							
Phila Electric	2	3	7	4-4	14.5	11.9	.6	2.6	1	-2.3	1.8	10	2.9	75
Phila Suburban			4	RVW			1.0							
Philip Morris	1	2	9	1-1	19.1	13.2	.8	5.9	1	18.0	18.0	15	9.0	45
Philips Inds	10	4	4	2-2	9.8	15.5	1.3	-5.6	10	2.0	6.9	10	7.0	40
Phillips Petrol			10	DEX			1.0							

Tick Symbol	X	Five Year Return On Equity Last %	Five Year Return On Equity Next %	Projected EPS Growth Rate Quarterly EPS Ending	Quarterly EPS Y-To-Y %	Fiscal Year Ending	Fiscal Year Curr. %	Fiscal Year Next %	Change in EPS Est. 1 Mo.	Change in EPS Est. 3 Mo.	Earnings Volatility Class	Analyst	Ind. Page
OLS	A	15	21	DC	16	DC85	19		NA	NA	D	Levine	18
OKE	N	14	16			AU86	16		C	C	D	Garcia	38
ORU	N	13	15			DC85	-4	8	C	NA	A	Toole	37
OM	N	10	16	SP	19	SP85	-39	41	C	C	E	Vogel	21
OVT	N	18	19			DC85	14	12	C	C	C	Fischer	35
OCF	N	9	15	DC	18	DC85	11	5	C	D	E	Goldfarb	14
OI	N	8	13	DC	6	DC85	11	19	C	C	E	Palm	31
OXM	N	16	14	NV	64	MY86	41	56	C	C	E	Gall	21
OZA	A	8	13	SP	-115	DC85	-35	0	C	D	E	Snyder	21
PHH	N	18	24	OC	11	AP86	13	10	C	C	A	Mosteller	23
PNCF	O	15	16	DC	1	DC85	17	11	B	B	A	Barkocy	33
PPG	N	13	18	DC	22	DC85	8	6	C	B	D	Curran	14
PSA	N	5	7	DC	1090	DC85	600	-50	NA	NA	E	Snyder	21
PCAR	O	12	20	DC	-42	DC85	-41	4	D	D	E	Allen	23
PCG	N	13	13			DC85	3	4	C	NA	B	Hyman	37
PLT	N	12	10			DC85	43	3	C	C	C	Fairechio	38
PAC	N	13	14			DC85	9	6	NA	NA	E	Avellis	35
PPW	N	14	16			DC85	8		NA	NA	B	Toole	37
PLL	A	24	23			JL86	21	20	C	C	A	Kavanagh	27
PN	N	-36	21	SP	100	DC85	-25	180	NA	NA	E	Snyder	21
PI	N	20	15			AU86	51		C	C	C	Suhl	18
PEL	N	14	17			DC85	-36	0	C	C	C	Garcia	29
PKD	N	7									E	Whipple	28
PH	N	13	20	DC	-15	JE86	1		D	D	E	Rossi	24
PNP	N	13	13	NV	7	FB86	-4	15	D	E	B	Curran	14
PCI	N	15	21	NV	21	NV85	-3	21	D	D	C	Curran	14
JCP	N	12	12			JA86	-1	11	C	NA	C	Feiner	20
PPL	N	12	11			DC85	-19	3	C	C	B	Kelley	37
PSM	N	8									D		30
PNTA	O	15	17	DC	13	DC85	-1	13	D	D	D	Diverio	32
PEXP	O	1									E	Snyder	21
PZL	N	19	24			DC85	93	-1	C	C	C	Shimmerlik	28
PGL	N	13	13			SP85	21	0	C	C	E	Fairechio	38
PBY	N	16	20			JA86	10		NA	NA	B	Braverman	19
PEP	N	16	21	DC	29	DC85	27	18	C	B	C	Kaplan	16
PKN	N	14	14	OC	-3	JL86	-5	29	C	E	C	Kurlak	27
PST	N	18	17			JA86	31	20	C	C	A	Roth	17
PLIT	O	19	17	OC	-17	OC85	-4	10	C	D	B	Hardiman	28
PFE	N	18	28	SP	14	DC85	14	11	C	C	B	Vietor	16
PD	N	-5									E	Roling	31
PE	N	12	14			DC85	-2		NA	NA	A	Kelley	37
PSC	N	10									B		28
MO	N	21	18	DC	26	DC85	23	19	D	D	A	Kaplan	23
PHL	N	18	15	SP	13	MR86	16	16	C	C	B	Curran	15
P	N	14									C	Shimmerlik	28

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Securities

Quantum
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Quantitative
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Alphabetical Index & Model Details

Gr	In	Company	Month End Price ($)	Ratings ST	Ratings LT	Ratings QV	Quantitative Pot Ret	Quantitative Alpha	Value Bk/ Prc	Value Imp Ret	Value Rel P/E	Value Str DDM	Momentum EPS Mom	Momentum Prof Mom	Momentum Ret Mon	Momentum Ret Qtr	Surp EPS Last
10	28	OKLAHOMA GAS & ELEC CO	22	3	2	4	12.9	-1.2	64	55	26	12	54	73	59	21	40
10	55	ONEOK INC	28	-	-	5	10.7	-3.4	80	79	52	16	19	66	38	32	5
03	47	OUTBOARD MARINE CORP	22	-	-	4	13.4	-0.9	81	24	18	71	71	60	39	56	22
01	87	OVERNITE TRANSN CO	33	-	-	+4	12.4	-2.1	22	63	19	43	59	47	29	85	24
07	53	OWENS CORNING FIBERGL	32	-	-	4	13.4	-1.0	73	27	93	50	74	70	37	43	21
01	21	OWENS ILL INC	47	-	-	2	16.2	2.1	79	41	27	72	20	71	45	79	65
03	07	PACCAR INC	44	-	-	+2	15.2	1.0	69	56	18	77	39	57	59	88	45
10	28	PACIFIC GAS & ELEC CO	18	3	2	1	17.9	3.8	74	93	73	46	78	96	61	42	62
10	55	PACIFIC LTG CORP	41	2	2	-4	12.8	-1.3	66	71	24	19	22	73	51	35	38
10	80	PACIFIC TELECOM INC	13	-	-	1	18.2	4.0	56	79	53	76	27	64	81	74	80
10	80	PACIFIC TELESIS GROUP	70	-	-	2	16.3	2.2	76	NA	21	26	NA	NA	31	36	85
10	28	PACIFICORP	28	3	2	-2	16.8	2.8	54	77	56	30	63	91	48	50	71
06	34	PAINE WEBBER GROUP INC	29	2	2	+2	16.5	1.7	50	74	68	40	84	79	49	11	NA
01	17	PALL CORP	38	-	-	3	13.9	-0.5	7	53	81	51	68	14	63	85	NA
01	03	PAN AM CORP	7	2	3	-	NA	NA	NA	NA	NA	NA	NA	NA	39	78	49
05	56	PANHANDLE EASTN CORP	34	-	-	5	10.2	-4.1	84	61	8	12	32	36	68	56	12
09	19	PARADYNE CORP	8	-	-	5	10.0	-4.5	89	2	14	80	NA	1	4	6	7
05	60	PARKER DRILLING CO	4	-	-	-	NA	NA	98	NA	NA	NA	NA	NA	3	8	76
01	14	PAYLESS CASHWAYS INC	14	-	-	-3	15.0	0.5	44	73	92	90	85	58	10	5	18
09	20	PDA ENGINEERING	13	2	2	-	NA	NA	5	NA	NA	88	NA	NA	97	99	NA
02	65	PEABODY INTL CORP	10	-	-	5	11.8	-2.5	72	8	75	14	13	13	38	93	57
04	41	PEAK HEALTH CARE INC	13	-	-	1	17.6	2.9	22	NA	90	99	NA	NA	17	7	57
07	25	PENN CENT CORP	49	-	-	4	12.5	-1.9	57	7	15	93	52	34	46	42	18
03	75	PENNEY J C INC	49	-	-	+2	15.3	1.0	83	62	54	48	58	76	81	57	45
10	28	PENNSYLVANIA PWR & LT	24	4	4	5	10.7	-3.3	82	61	16	5	1	65	55	45	25
05	61	PENNZOIL CO	48	3	2	2	16.3	2.0	27	73	64	39	23	53	63	51	84
02	51	PENTA SYS INTL INC	1	-	-	-	NA	NA	97	NA	99	99	NA	NA	1	2	NA
01	03	PEOPLE EXPRESS INC	11	3	+3	-	NA	NA	64	NA	99	NA	NA	NA	3	93	50
10	55	PEOPLES ENERGY CORP	16	-	-	4	12.2	-1.9	54	71	33	21	21	90	83	62	19
04	13	PEPSICO INC	60	3	2	2	16.8	2.6	17	38	49	52	34	39	88	72	99
09	31	PERKIN ELMER CORP	25	3	+2	4	12.5	-1.9	34	19	77	56	32	18	61	64	41
03	73	PERRY DRUG STORES INC	13	2	2	1	18.0	3.7	32	31	41	87	48	49	10	50	94
01	17	PETROLITE CORP	24	-	-	+3	14.0	-0.2	42	81	90	57	67	64	9	21	20
04	26	PFIZER INC	47	1	1**	3	14.5	0.2	13	26	73	37	63	42	73	60	67
08	23	PHELPS DODGE CORP	20	-	-	+3	13.7	-0.8	93	1	2	1	NA	NA	46	96	83
08	52	PHIBRO SALOMON INC	35	-	-	1	19.1	4.3	31	96	52	80	89	80	16	11	74
10	28	PHILADELPHIA ELEC CO	14	4	4	2	15.6	1.6	89	96	61	10	50	94	37	53	55
04	84	PHILLIP MORRIS COS INC	75	2	2	1	23.1	8.8	23	96	85	88	94	93	36	29	96
05	61	PHILLIPS PETE CO	12	2	2	2	15.7	1.4	36	93	54	24	8	76	70	62	73
03	75	PIC N SAVE CORP	24	-	-	2	16.4	2.0	1	85	56	83	92	33	32	16	53
01	03	PIEDMONT AVIATION INC	30	2	2	1	17.9	3.5	49	90	40	62	59	87	54	36	70
04	35	PILLSBURY CO	58	1	1	-2	15.8	1.6	22	32	8	68	55	42	99	90	72
05	56	PIONEER CORP TEX	22	-	-	5	11.8	-2.7	36	63	32	7	40	14	11	37	52
03	39	PIONEER ELECTR CORP	14	3	3	5	7.5	-6.5	46	3	20	2	5	1	77	51	NA
04	35	PIONEER HI BRED INTL	32	3	2	+1	17.7	3.5	20	88	86	57	76	76	26	61	NA
09	57	PITNEY BOWES INC	39	-	-	3	14.9	0.6	27	67	28	56	64	61	75	27	48
08	18	PITTSTON CO	13	-	-	-5	11.9	-2.5	50	NA	4	2	NA	2	93	96	65
03	70	PIZZA INN INC	8	-	-	-	NA	NA	68	NA	NA	NA	NA	NA	53	57	NA
06	10	PNC FINL CORP	27	-	-	1	19.1	5.0	56	87	43	64	77	78	14	26	87
07	53	POLAROID CORP	31	-	-	3	14.3	0.0	73	1	66	24	22	5	77	73	94
09	20	POLICY MGMT SYS CORP	18	3	3	2	15.6	1.1	12	23	95	89	NA	NA	3	13	53
03	70	PONDEROSA INC	14	3	2	+3	13.9	-0.5	78	12	25	20	96	16	99	99	66
02	50	PORTEC INC	16	-	-	3	14.2	0.0	77	15	91	8	NA	25	38	5	86
10	28	PORTLAND GEN ELEC CO	18	3	3	4	13.3	-0.8	82	86	21	19	86	89	36	19	20
08	36	POTLATCH CORP	34	-	-	5	10.7	-3.5	85	17	71	17	14	38	71	63	27

Exch Symb	Ftnt	Beta	Cur Yld	Mkt Val	FY3 Date	FY3 EPS	Chg FY3/ FY2 EPS	P/E FY3 EPS	Proj 5-Year Growth EPS	Proj 5-Year Growth DPS	Tot Ret % Last Mon	Tot Ret % Last Qtr	Tot Ret % Last Yr	Coverage
OGE	U	0.64	9.0	936	12/86	2.65(3)	13(3)	8.4	5	5U	-4	-13	9	ABRAMSON
OKE		0.75	9.1	376	08/86	3.13(4)	14(3)	9.0	6	6M	-7	-10	8	S&P SUPPLEMENTAL
OM		0.94	3.0	364	09/86	2.27(2)	43(1)	9.5	13	13M	-7	-5	-11	S&P SUPPLEMENTAL
OVT		1.25	2.2	451	12/86	3.01(3)	11(4)	10.9	13	13S	-8	5	39	S&P SUPPLEMENTAL
OCF	*	1.25	4.3	962	12/86	3.56(4)	8(4)	9.1	10	10M	-7	-8	7	S&P SUPPLEMENTAL
OI	*	0.79	3.8	1,406	12/86	5.46(5)	9(4)	8.7	13	13M	-6	2	20	S&P SUPPLEMENTAL
PCAR		0.75	5.0	796	12/86	3.68(4)	-15(5)	11.9	13	13M	-4	7	1	S&P SUPPLEMENTAL
PCG		0.64	10.4	5,799	12/86	3.05(3)	5(5)	5.8	5	6U	-4	-8	32	ABRAMSON
PLT		0.69	8.2	1,604	12/86	5.50(5)	47(1)	7.4	7	7M	-5	-10	24	FLEISCHER
PTCM	M	0.90	6.0	500	12/86	1.64(2)	31(2)	8.1	15	15M	0	1	15	S&P SUPPLEMENTAL
PAC	U	0.67	8.2	7,024	12/86	9.43(5)	5(5)	7.4	6	6M	-8	-9	17	S&P SUPPLEMENTAL
PPW		0.64	8.3	1,806	12/86	4.05(4)	4(5)	6.9	6	5U	-5	-6	25	ABRAMSON
PWJ		2.00	2.1	482	12/86	2.90(3)	29(2)	10.0	14	8M	-5	-17	1	FISHER
PLL		1.14	1.3	680	07/86	2.21(2)	18(2)	17.0	18	18M	-3	5	3	S&P SUPPLEMENTAL
PN		0.89	0.0	950	12/86	0.70(1)	NA(-)	10.4	3	-M	-7	2	45	BECKER
PEL		1.04	6.8	1,502	12/86	2.95(3)	14(3)	11.5	7	7M	-3	-5	-3	S&P SUPPLEMENTAL
PDN	*	1.39	0.0	181	12/86	0.64(1)	NA(-)	12.5	28	-M	-17	-22	-30	S&P SUPPLEMENTAL
PKD		1.44	2.0	118	08/86	-2.32(1)	NA(-)	NA	8	8M	-20	-19	-49	S&P SUPPLEMENTAL
PCI		1.34	1.1	518	11/86	1.46(1)	21(2)	9.7	20	20M	-13	-23	-15	S&P SUPPLEMENTAL
PDAS	MU	NA	0.0	47	06/86	0.65(2)	44(1)	20.0	30	-M	8	41	0	CONIGLIARO
PBD		0.94	2.0	112	09/86	0.64(1)	64(1)	15.4	13	13M	-7	10	21	S&P SUPPLEMENTAL
PHCI		1.73	0.0	68	12/86	1.01(2)	38(1)	12.4	38	-M	-11	-21	-33	S&P SUPPLEMENTAL
PC	*	1.09	0.0	1,910	12/86	3.94(4)	13(3)	12.4	24	-M	-5	-8	2	S&P SUPPLEMENTAL
JCP	*	1.00	4.9	3,618	01/87	5.99(5)	10(4)	8.1	9	9M	0	-5	-3	S&P SUPPLEMENTAL
PPL	U	0.64	10.5	1,816	12/86	2.50(4)	-4(5)	9.8	2	2U	-4	-7	13	ABRAMSON
PZL		1.09	4.6	2,027	12/86	4.75(5)	3(5)	10.0	11	8M	-3	-6	28	KNUETTEL
PSLI	MU	1.51	0.0	5	12/85	0.29(1)	NA(-)	3.4	30	-L	-27	-33	-73	S&P SUPPLEMENTAL
PEXP	M	1.34	0.4	268	12/86	0.50(1)	150(1)	22.5	6	-M	-21	10	-1	BECKER
PGL		0.69	7.4	525	09/86	2.25(2)	-3(5)	7.2	5	5M	0	-3	33	S&P SUPPLEMENTAL
PEP	*	0.89	3.0	5,470	12/86	5.05(5)	15(3)	11.9	13	13L	1	0	41	THOMPSON
PKN	*	1.34	2.3	1,092	07/86	1.55(2)	-11(5)	16.0	17	10M	-3	-2	9	WHITTINGTON
PDS	U	1.14	1.4	131	10/86	1.25(1)	19(2)	10.7	20	20M	-13	-6	12	CRANMER
PLIT		0.79	4.7	281	10/86	2.59(3)	12(3)	9.3	12	12M	-14	-13	-21	S&P SUPPLEMENTAL
PFE	*	1.04	3.1	7,749	12/86	3.95(4)	13(3)	12.0	13	8M	-2	-4	39	SWEIG
PD	*	1.39	0.0	543	12/86	0.51(1)	NA(-)	39.2	6	-S	-5	18	26	S&P SUPPLEMENTAL
PSB	*	1.94	1.5	5,163	12/86	4.13(4)	13(3)	8.5	15	15M	-11	-17	13	S&P SUPPLEMENTAL
PE		0.59	15.7	2,390	12/86	1.90(2)	-27(5)	7.4	0	0U	-7	-5	20	ABRAMSON
MO	*	0.89	5.3	8,935	12/86	11.50(5)	10(4)	6.5	14	16M	-7	-11	1	THOMPSON
P	*	1.14	8.3	2,735	12/86	1.70(3)	36(1)	7.1	6	5M	-2	-3	-4	KNUETTEL
PICN	M	1.29	0.0	622	12/86	1.75(3)	17(3)	13.5	21	-M	-7	-15	9	S&P SUPPLEMENTAL
PIE		1.19	0.9	504	12/86	4.00(4)	0(5)	7.5	10	5M	-4	-9	17	BECKER
PSY		0.79	3.0	2,522	05/87	5.25(5)	14(3)	11.1	14	11L	13	9	52	MCMILLIN
PNA		1.29	5.6	733	12/86	1.38(2)	3(5)	16.0	10	10M	-13	-9	-3	S&P SUPPLEMENTAL
PIO		0.59	0.6	931	09/86	0.37(1)	185(1)	38.9	8	20S	-1	-6	-34	JAPANESE
PHYB	M	0.89	2.9	1,006	08/86	3.75(4)	12(3)	8.4	12	12M	-9	-3	7	MCMILLIN
PBI	*	1.00	3.1	1,445	12/86	4.16(4)	11(4)	9.5	12	12M	-1	-12	23	S&P SUPPLEMENTAL
PCO	*	1.14	0.0	502	12/86	0.59(1)	NA(-)	22.5	8	-M	4	18	9	S&P SUPPLEMENTAL
PZA		NA	1.0	24	12/85	NA(5)	NA(-)	NA	-	-	-5	-4	-21	S&P SUPPLEMENTAL
PNCF		0.75	5.0	1,252	12/86	3.72(4)	9(4)	7.1	10	10M	-12	-12	29	S&P SUPPLEMENTAL
PRD	*	1.04	3.2	971	12/86	1.56(2)	100(1)	20.1	19	19M	-1	0	10	S&P SUPPLEMENTAL
PMSC	M	1.32	0.0	296	12/86	1.20(1)	20(2)	15.2	25	-M	-19	-16	-37	TAYLOR
PON		1.19	2.8	137	02/87	1.25(2)	150(1)	11.4	12	12M	21	32	-23	CULP
POR		0.84	3.9	58	12/86	1.69(2)	225(1)	9.2	10	10M	-7	-23	-8	S&P SUPPLEMENTAL
PGN		0.59	10.6	818	12/86	2.55(3)	6(5)	7.1	4	4U	-7	-14	29	ABRAMSON
PCH		1.00	4.6	517	12/86	2.95(3)	17(3)	11.4	9	9M	-2	-3	20	S&P SUPPLEMENTAL

PHILA. ELECTRIC NYSE-PE

RECENT PRICE 15 | P/E RATIO 5.7 (Trailing 5.1 / Median 7.5) | RELATIVE P/E RATIO 0.51 | DIV'D YLD 14.7% | 203

1988 | 1989 | 1990

September 27, 1985 Value Line

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
Price— High	25.1	25.0	23.5	19.5	15.5	18.0	21.3	19.8	17.8	17.0	14.4	17.5	18.3	18.0	16.9			
Price— Low	20.6	21.3	17.0	9.4	11.1	14.9	17.1	15.0	13.5	11.4	11.9	13.0	13.5	9.0	13.8			
Insider Decisions	1984																	
	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J			
to Buy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
to Sell	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Institutional Decisions	2Q'84	3Q'84	4Q'84	1Q'85	2Q'85													
to Buy	23	30	29	35	47													
to Sell	24	26	28	24	26													
Hld's(000)	18385	18946	21078	22894	24338													
Percent shares traded																		
Revenues per sh	14.36	15.15	15.32	14.64	18.97	17.66	17.66	18.69	19.04	19.05	22.92	22.43	21.03	18.18	18.37	17.15	18.10	
"Cash Flow" per sh	3.24	3.34	3.29	3.04	3.24	3.10	3.22	3.22	3.37	3.29	3.29	3.39	3.48	3.48	3.70	3.55	3.80	
Earnings per sh	1.84	2.10	2.08	1.99	1.81	1.86	1.91	1.87	1.87	1.86	2.00	2.25	2.39	2.40	2.70	2.65	2.80	
Div'd Decl'd per sh	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.76	1.80	1.80	1.80	1.90	2.06	2.12	2.20	2.20	2.35	
Cap'l Spending per sh	10.01	8.76	8.94	6.31	8.94	5.63	5.48	5.75	5.30	5.09	6.26	7.25	6.92	7.21	6.49	5.40	4.60	
Book Value per sh	18.95	19.54	20.00	19.61	20.21	19.05	19.13	19.26	19.28	19.06	18.72	18.10	17.93	17.99	17.81	17.90	18.15	
Common Shs Outst'g (m)	35.13	40.14	44.73	52.38	53.33	64.20	69.31	74.62	76.51	82.88	92.63	108.51	125.77	142.81	162.30	177.35	187.85	
Avg Ann'l P/E Ratio	11.6	10.8	11.0	10.5	7.3	7.4	8.7	10.4	9.5	8.4	6.8	5.8	6.3	7.0	5.0			
Relative P/E Ratio	.83	.69	.75	1.04	1.02	.99	1.11	1.36	1.29	1.22	.90	.70	.69	.59	.46			
Avg Ann'l Div'd Yield	7.7%	7.2%	7.2%	7.9%	12.5%	12.0%	8.9%	9.1%	10.1%	11.5%	13.2%	14.6%	13.6%	12.6%	16.3%			
Revenues ($mill)	1224.1	1394.8	1456.8	1578.5	2123.4	2433.4	2644.8	2596.1	2981.0	3000	3400							
Net Profit ($mill)	464.6	173.4	184.9	194.5	227.1	277.6	336.2	389.1	492.4	500	570							
Income Tax Rate	31.7%	28.3%	28.2%	18.9%	16.4%	19.3%	28.2%	22.4%	20.9%	22.5%	24.0%							
Net Profit Margin	13.5%	12.4%	12.7%	12.3%	10.7%	11.4%	12.7%	15.0%	16.5%	17.8%	17.7%							
Long-Term Debt Ratio	51.0%	51.3%	51.4%	50.9%	49.9%	51.3%	50.9%	50.0%	51.7%	49.0%	48.0%							
Common Equity Ratio	34.9%	35.5%	34.9%	35.9%	36.5%	36.7%	37.9%	38.0%	36.8%	39.5%	40.5%							
Total Capital ($mill)	3897.2	4049.7	4231.9	4401.2	4752.4	5348.7	5947.7	6758.5	7851.5	8000	8400							
Net Plant ($mill)	3886.9	4165.9	4449.2	4741.4	5180.0	5714.1	6455.6	7272.2	8459.9	9200	9870							
% Earned Total Cap'l	6.3%	6.3%	6.5%	6.6%	7.0%	7.7%	8.3%	8.2%	8.8%	8.5%	8.5%							
% Earned Net Worth	8.8%	8.8%	9.0%	9.0%	9.5%	10.7%	11.5%	11.5%	13.0%	12.0%	13.0%							
% Earned Comm Equity	9.5%	9.2%	9.6%	9.5%	10.1%	11.4%	12.3%	12.5%	14.1%	14.0%	14.0%							
% Retained to Comm Eq	1.3%	.6%	.4%	.3%	1.0%	1.8%	1.7%	1.4%	2.6%	2.5%	2.0%							
% All Div'ds to Net Prof	89%	95%	97%	98%	93%	88%	89%	91%	85%	86%	89%							

Bold figures are Value Line estimates

	88-90E
Revenues per sh	20.00
"Cash Flow" per sh	4.20
Earnings per sh (A)	2.80
Div'd Decl'd per sh (B)	2.40
Cap'l Spending per sh	4.50
Book Value per sh	19.50
Common Shs Outst'g (m)	204.30
Avg Ann'l P/E Ratio	8.5
Relative P/E Ratio	.70
Avg Ann'l Div'd Yield	10.0%
Revenues ($mill)	4250
Net Profit ($mill)	580
Income Tax Rate	30.0%
Net Profit Margin	16.0%
Long-Term Debt Ratio	48.5%
Common Equity Ratio	40.0%
Total Capital ($mill)	9900
Net Plant ($mill)	11800
% Earned Total Cap'l	9.5%
% Earned Net Worth	13.5%
% Earned Comm Equity	14.0%
% Retained to Comm Eq	2.0%
% All Div'ds to Net Prof	86%

TIMELINESS (Relative Price Performance Next 12 Mos.) 3 Average

SAFETY (Scale: 1 Highest to 5 Lowest) 4 Below Average

BETA .50 (1.00 = Market)

1988-90 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	30	(+100%)	26%
Low	18	(+ 20%)	17%

Target Price Range: 1988 24, 1989 20, 1990 16

.93 X Dividends p sh divided by Interest Rate

Relative Price Strength

CAPITAL STRUCTURE as of 6/30/85

Total Debt $4515.5 mill. Due in 5 Yrs $808.8 mill.

LT Debt $4434.7 mill. LT Interest $417.4 mill.

Incl. $18.4 mill. debt discount.

Incl. cap. leases $265.2 mill.

LT Interest earned: 1.6x

Pension Liability None in '84 vs. None in '83

Pfd Stock $890.9 mill. Pfd Div'd $87.6 mill.

8,977,950 shs. 3.8% to 17.125%, all cum. and $100 par. Callable at prices ranging from $101 to $171.125/sh. Incl. 8,253,230 shs. with mandatory redemption requirements.

Common Stock 169,228,697 shs.

ELECTRIC OPERATING STATISTICS

	1982	1983	1984
% Change Sales (KWH)	+4.6	−6.7	+6.6
Avg. Resid'l Use (KWH)	6544	6990	6980
Avg. Revs. per KWH (¢)	7.37	7.64	8.29
Capacity at Peak (Mw)	8006	7974	7765
Peak Load, Summer (Mw)	5691	5879	5925
Annual Load Factor (%)	56.8	58.1	57.7
% Change Customers (yr-end)	+.6	+.9	+1.1
Fixed Charge Cov. (%)	131	118	117

ANNUAL RATES of change (per sh)

	Past 10 Yrs	Past 5 Yrs	Est '82-'84 to '88-'90
Revenues	1.5%	.5%	1.5%
"Cash Flow"	1.0%	1.5%	3.0%
Earnings	2.5%	6.0%	2.0%
Dividends	2.5%	3.5%	2.0%
Book Value	−1.0%	−1.5%	1.5%

QUARTERLY REVENUES ($ mill.)

Calendar	Mar. 31	June 30	Sept. 30	Dec. 31	Full Year
1982	757.1	592.6	661.6	633.5	2644.8
1983	723.2	572.2	668.3	632.4	2596.1
1984	818.0	703.2	755.6	704.2	2981.0
1985	852.3	683.5	730	724.2	3000
1986	915	800	800	810	3400

EARNINGS PER SHARE (A)

Calendar	Mar. 31	June 30	Sept. 30	Dec. 31	Full Year
1982	.71	.42	.73	.53	2.39
1983	.70	.44	.78	.48	2.40
1984	.79	.58	.73	.60	2.70
1985	.79	.57	.74	.55	2.65
1986	.75	.55	.75	.55	2.60

QUARTERLY DIVIDENDS PAID (B)

Calendar	Mar. 31	June 30	Sept. 30	Dec. 31	Full Year
1981	.45	.45	.50	.50	1.90
1982	.50	.50	.53	.53	2.06
1983	.53	.53	.53	.53	2.12
1984	.55	.55	.55	.55	2.20
1985	.55	.55			

BUSINESS: Philadelphia Electric Company supplies electricity (81% of revs.), gas (16%) and steam (3%) in Philadelphia and environs. Service area is highly industrialized. Electric revenues: residential, 35%; commercial, 15%; industrial, 42%; other, 8%. Gas revenues: residential, 44%; commercial and industrial, 45%; other, 11%. Prime fuels: oil, 15%; coal, 22%; nuclear, 18%; hydro, 4%; purchased power, 41%. Fuel costs: 47% of revenues; labor, 17%. '84 depreciation rate: 1.9%. Estimated plant age: 9 yrs. Has 10,506 employees, 208,257 common stockholders. Chairman & C.E.O.: J.L. Everett. President: J.H. Austin, Jr. Incorporated: Pennsylvania. Address: 2301 Market St., Philadelphia, PA 19101.

First the good news: Limerick #1 is up and running again. On August 21, a federal appeals court ended a temporary stay blocking the full-power operation of the nuclear plant. While the stay was in effect, the utility was forced to cut power back to less than 5% of capacity. The plant is now at about 25% of capacity. PE will continue to test and bring the plant to full power, with commercial operation expected in early 1986. Management estimates that every month of delay before commercial operation will cost an additional $33-$40 million, mostly in capital costs.

Now the bad news: Things are not going so well with Limerick #2. A recent Administrative Law Judge (ALJ) recommendation concluded that the completion of Limerick #2 is not in the best interest of ratepayers. The ALJ recommended cancellation of the plant, with PE recovering prudently incurred sunk costs over several years, but with no return on the unamortized balance. That would be consistent with past treatment of cancelled plants in Pennsylvania. State regulators are not bound by the ALJ recommendation and will render a decision later this year.

A cancellation ruling could severely penalize earnings. In the event of a cancellation of Limerick #2, PE would initially carry its $900 million investment on the books, earning no return. We estimate that would lower reported earnings by 40¢-50¢ a share. In addition, the commission may deem a portion of PE's costs imprudently incurred, and not eligible for recovery. Any such mismanagement penalties would have to be written off. We believe that PE has sufficient unrestricted retained earnings to maintain the present common dividend even with a punitive writeoff.

We're not too worried about dividend cuts. Nevertheless, these shares are not for faint-hearted investors. The principal risk is that if the commission calls for the cancellation of Limerick #2, the utility may elect to cut the dividend to ease financial pressures. Until regulators decide, most investors should avoid the stock. *P.W.L./J.M.F.*

Regulated Revenues (and Pretax Margins) by Business Line

	1982	1983	1984	1985
Electric	$2188.3 (16.6%)	$2107.9 (17.3%)	$2435.7 (17.0%)	$2600 (17.0%)
Gas	388.4 (6.3%)	417.1 (6.4%)	463.0 (7.7%)	470 (7.5%)
Steam	73.4 (2.6%)	71.1 (2.6%)	82.3 (5.3%)	80.0 (5.5%)
Company Total	2644.8 (14.7%)	2596.1 (15.2%)	2981.0 (15.2%)	3000 (15.5%)

(A) Next earnings report due late Oct. Estimated current cost egs./sh.: '84, 75¢.
(B) Next dividend meeting about Oct. 28. Goes ex about Nov. 6. Dividend payment dates: Mar. 30, June 29, Sept. 30, Dec. 19. ■ Dividend reinvestment plan available (qual'd $750 tax deferred). (C) Rate base determin.: Fair Value. Rate allowed on common equity in '84: 16.2%. Regulatory Climate: Below Average. (D) In millions.

Company's Financial Strength	C++
Stock's Price Stability	100
Price Growth Persistence	10
Earnings Predictability	95

"Factual material is obtained from sources believed to be reliable. Information contained in Value Line publications is believed to be accurate and complete but cannot be guaranteed.

Beco Sept. I, 9:4

Stock Research

Investment Policy

Salomon Brothers Inc

One New York Plaza
New York, NY 10004
(212) 747-7000

November 15, 1985

Monthly Stock Review

Changes in Investment Codes

Upgraded

Ameritech	Ford	Pacific Telesis
Bell Atlantic	GTE Corp.	Prime Computer
Champion Int'l.	IFF	Southwestern Bell
Cincinnati G&E	Kennametal	Zenith
Commonwealth Ed	NYNEX	

Downgraded

Aetna Life & Casualty	Delta Air Lines	PepsiCo
Ahmanson (H.F.)	Eastern Air Lines	Potlatch
AirCal Inc.	General Motors	Republic Airlines
American Federal	Golden West Financial	Safeco Corp
Armstrong World Indust.	Home Federal, San Diego	Sierra Health Services
Bell Regionals	M/A-COM	UAL Inc.
Central & South West	Ozark Air Lines	USAir
Coca-Cola Bottling	Pennzoil	U.S. Steel
Consol.	People Express	Western Air Lines
Data General		

Industry Groups

Aerospace/Defense	4-5	Insurance	14-15
Airlines	4-5	Mainframe Computers	14-15
Automobiles	4-5	Media	16-17
Banks	4-7	Metals (Nonferrous)	16-17
Beverages	6-7	Metals (Steels)	16-17
Capital Goods	6-7	Minicomputers	18-19
Chemicals	6-9	Multi-Industry Companies	18-19
Construction	8-9	Oil Service	18-19
Cosmetics/Toiletries	8-9	Oils (Domestic)	18-19
Electric Utilities	8-11	Oils (International)	20-21
Electrical Products	10-11	Pharmaceuticals	20-21
Electronics	10-13	Retailing	20-21
Financial Services	12-13	Special Situations	20-21
Foods	12-13	Telecom. Equipment	20-21
Forest Products & Paper	12-13	Telecom. Services	20-23
Health Services	12-15	Thrift Industry	22-23
Home Furnishings	14-15	Tire & Rubber	22-23
Hospital Supplies	14-15	Tobacco	22-23
Household Products	14-15		

Market Index

	Recent Price (Nov 15)	52 Week High	52 Week Low	EPS 1985E	EPS 1986E	EPS 1987E	Dividend 1985E	Dividend 1986E	1986E P/E	1986E Yield
S&P 500	198.11	199.06	161.81	15.50	17.00	18.25	8.00	8.50	11.7	4.3

E Salomon Brothers Inc estimate.

	Code	Recent Price ($)	52 Week Hi ($)	52 Week Lo ($)	Cur Yld (%)	Ind Div Rate ($)	Div Growth Next 5 Yrs (%)	O/C
Electric Utilities — Mark D. Luftig/Gregory B. Enholm (747-7142) (Continued)								
IPALCO ENT INC	U- 34/182	36.63	40	31	8.3	3.04	5.00	C
KANSAS GAS AND ELEC	U- 11/182	13.25	20	10	8.9	1.18	NA	O
LONG ISLAND LT	U- 7/182	7.50	9	6	0.0	0.00	NA	C
MIDDLE SOUTH UTIL	O- 9/187	9.75	15	8	0.0	0.00	NA	O
MINNESOTA P&L	M- 34/182	38.50	39	28	7.2	2.76	6.50	
NEW ENGLAND ELEC	M- 41/182	46.38	47	36	7.8	3.60	7.00	
NEW YORK STATE E&G	U- 26/186	26.75	29	20	9.6	2.56	4.50	
NIAGARA MOHAWK PWR	U- 18/186	20.38	22	16	10.2	2.08	5.00	
NORTHEAST UTIL	M- 15/182	17.63	18	14	9.0	1.58	5.50	
NORTHERN IND P.S.	U- 12/182	9.88	15	10	15.8	1.56	1.00	C
NORTHERN STATES PWR	U- 46/182	49.13	52	41	7.2	3.52	7.50	
OHIO EDISON	U- 15/182	16.00	16	13	11.8	1.88	3.00	
OKLAHOMA G&E	U- 23/182	24.63	26	21	8.1	2.00	6.00	
PACIFIC G&E	U- 18/186	19.63	20	16	9.4	1.84	5.00	
PACIFICORP	U- 28/182	29.75	32	24	8.1	2.40	6.50	
PENNSYLVANIA P&L	U- 24/182	27.25	28	24	9.4	2.56	5.50	
PHILADELPHIA ELEC	U- 14/182	15.75	17	13	14.0	2.20	1.00	
PORTLAND GEN ELEC	U- 19/182	20.88	22	16	9.1	1.90	4.50	
POTOMAC ELEC PWR	M- 29/182	32.88	34	23	6.6	2.16	7.00	C
PUB SVC COLO	U- 21/182	20.63	24	18	9.7	2.00	5.50	
PUB SVC E&G	M- 29/182	31.38	33	25	9.1	2.84	5.00	
PUB SVC IND	U- 9/182	8.63	10	7	11.6	1.00	NA	
PUB SVC N.M.	U- 27/182	28.50	30	22	10.2	2.92	4.50	
SAN DIEGO G&E	U- 26/186	26.88	28	22	8.3	2.24	6.00	
SOUTHERN CAL ED	U- 24/182	24.75	28	22	8.7	2.16	6.00	C
SOUTHERN CO	U- 20/182	21.50	23	18	9.5	2.04	5.00	O
TECO ENERGY	U- 31/182	33.50	37	27	7.0	2.36	7.00	
TEXAS UTIL	U- 27/182	29.63	32	25	8.5	2.52	6.00	
UTAH P&L	U- 23/182	26.00	27	21	8.9	2.32	4.50	
WISCONSIN ELEC PWR	M- 35/182	37.50	41	30	6.6	2.48	8.00	
Electrical Products (Consumer) — Russell L. Leavitt (747-7801)								
MAGIC CHEF	M 45/187	53.75	54	31	2.1	1.12	5.00	
MAYTAG	M 57/187	68.00	72	43	5.2	3.55	7.00	
RCA	O 43/187	48.13	50	34	2.2	1.04	8.00	
WHIRLPOOL	M 46/187	46.13	51	41	4.3	2.00	8.00	
ZENITH	M 18/193*	17.88	25	16	0.0	0.00	0.00	
Electrical Products (Equipment) — Russell L. Leavitt (747-7801)								
COMBUSTION ENGINEERING	M+ 28/193	28.75	38	24	3.5	1.00	0.00	
EMERSON ELECTRIC	O+ 70/193	72.50	78	66	3.8	2.76	12.00	
GENERAL ELECTRIC	O+ 61/193	64.00	65	53	3.4	2.20	12.00	
SQUARE D	O+ 39/193	40.00	44	35	4.6	1.84	5.00	
WESTINGHOUSE	O+ 43/193	43.75	44	24	2.7	1.20	9.00	
WW GRAINGER	M+ 33/193	34.75	36	27	2.0	0.68	12.00	
Electronics (Instruments) — Mona E. Eraiba (747-6090)								
HEWLETT PACKARD	O 32/184	33.38	39	29	0.7	0.22	17.00	O
PERKIN-ELMER	O 24/184	28.38	30	22	2.0	0.56	13.00	O
TEKTRONIX	M 49/184	53.25	68	47	1.9	1.00	12.00	O
Electronics (Semiconductors) — Mona E. Eraiba (747-6090)								
ADV MICRO DEV	M 24/184	25.88	36	22	0.0	0.00	0.00	O
INTEL	M 24/184	27.00	33	21	0.0	0.00	0.00	C
MOTOROLA INC	O 34/184	34.88	39	29	1.8	0.64	15.00	O
NATIONAL SEMI	M 11/184	12.13	15	10	0.0	0.00	0.00	O
TEXAS INSTRUMENTS	M 93/184	98.25	132	86	2.0	2.00	12.00	O

Cur P/E	Rel P/E Cur (%)	Rel P/E 5-Yr Range (%)	FY End	Annual EPS Act ($)	Annual EPS Prev Est ($)	Annual EPS Cur FY Est ($)	Annual EPS Next ($)	Quarterly EPS Qtr End	Quarterly EPS Est ($)	Quarterly EPS Yr Ago ($)	EPS Growth Next 5 Yrs (%)	
8.8	69	105 - 49	DEC84	4.22	4.00	3.85	4.15	DEC	NA	NA	6.50	IPL
12.0	94	72 - 40	DEC84	3.07	2.30	2.00	1.10	DEC	NA	NA	NA	KGE
2.3	18	77 - 12	DEC84	3.09	3.30	3.40	3.20	DEC	NA	NA	NA	LIL
4.9	38	76 - 33	DEC84	2.76	2.20	2.30	2.00	DEC	NA	NA	3.50	MSU
8.1	63	84 - 48	DEC84	4.06	4.60	4.80	4.75	DEC	NA	NA	7.00	MPL
6.9	54	82 - 46	DEC84	6.04	6.60	6.45	6.70	DEC	NA	NA	7.00	NES
7.4	58	70 - 39	DEC84	3.68		3.60	3.60	DEC	NA	NA	5.00	NGE
7.3	56	82 - 41	DEC84	2.84	2.85	2.80	2.80	DEC	NA	NA	4.50	NMK
6.8	53	94 - 36	DEC84	2.85		2.75	2.60	DEC	NA	NA	6.50	NU
8.2	64	150 - 55	DEC84	1.62	1.25	1.05	1.20	DEC	NA	NA	3.00	NI
8.1	62	86 - 42	DEC84	5.80	5.95	5.75	6.10	DEC	NA	NA	8.00	NSP
6.5	51	108 - 37	DEC84	2.50	2.40	2.35	2.45	DEC	NA	NA	3.00	OEC
8.6	67	94 - 50	DEC84	2.47		2.40	2.85	DEC	NA	NA	6.50	OGE
6.8	52	88 - 40	DEC84	2.62	3.60	2.80	2.90	DEC	NA	NA	6.00	PCG
7.6	59	96 - 39	DEC84	3.42	3.60	3.65	3.90	DEC	NA	NA	6.00	PPW
9.1	71	83 - 47	DEC84	3.12		2.75	3.00	DEC	NA	NA	5.50	PPL
7.2	55	89 - 33	DEC84	2.70	2.60	2.50	2.20	DEC	NA	NA	2.00	PE
8.0	62	79 - 35	DEC84	2.80	2.40	2.50	2.60	DEC	NA	NA	4.50	PGN
9.0	70	90 - 49	DEC84	3.23	3.45	3.50	3.65	DEC	NA	NA	7.00	POM
9.2	71	94 - 60	DEC84	2.55	2.30	2.05	2.25	DEC	NA	NA	5.50	PSR
7.8	61	95 - 50	DEC84	3.95		3.90	4.00	DEC	NA	NA	5.00	PEG
6.9	53	123 - 19	DEC84	1.06		1.05	1.25	DEC	NA	NA	NA	PIN
8.1	63	100 - 48	DEC84	3.11		3.30	3.50	DEC	NA	NA	4.50	PNM
8.0	62	162 - 39	DEC84	3.01		3.25	3.35	DEC	NA	NA	6.50	SDO
7.1	55	85 - 44	DEC84	3.18	3.25	3.35	3.50	DEC	NA	NA	7.50	SCE
6.5	50	88 - 43	DEC84	3.00		3.20	3.30	DEC	NA	NA	5.00	SO
8.6	67	94 - 42	DEC84	3.72		3.60	3.90	DEC	NA	NA	8.00	TE
6.6	51	78 - 46	DEC84	4.15		4.40	4.50	DEC	NA	NA	7.50	TXU
10.2	79	108 - 63	DEC84	2.42		2.50	2.55	DEC	NA	NA	4.50	UTP
7.9	61	83 - 44	DEC84	4.35	4.55	4.45	4.75	DEC	NA	NA	8.00	WPC
9.3	73	208 - 36	JUN85	5.63		5.55	5.75	DEC	1.30	1.16	7.00	MGC
12.7	99	141 - 67	DEC84	4.63		5.20	5.35	DEC	1.14	1.12	7.00	MYG
10.7	83	223 - 58	DEC84	3.30	3.90	4.00	4.50	DEC	1.10	1.03	9.00	RCA
9.2	72	120 - 56	DEC84	5.18		4.65	5.00	DEC	1.05	1.00	9.00	WHR
23.8	186	326 - NM	DEC84	2.88	0.25	-0.25	0.75	DEC	NA	0.51	5.00	ZE
14.4	112	165 - 41	DEC84	3.00	(2.00)	-2.75	2.00	DEC	0.50	0.68	8.00	CSP
NM	NM	146 - 85	SEP85	5.43		6.00	NA	DEC	1.40	1.33	12.00	EMR
11.1	87	121 - 66	DEC84	5.03		5.15	5.75	DEC	1.47	1.44	13.00	GE
10.7	83	149 - 55	DEC84	3.71	3.40	3.00	3.75	DEC	0.51	0.64	10.00	SQD
9.7	76	92 - 41	DEC84	3.04		3.45	4.50	DEC	1.05	0.91	9.00	WX
12.6	98	155 - 78	DEC84	2.38		2.50	2.75	DEC	0.70	0.64	12.00	GWW
14.2	111	256 -112	OCT84	2.13		1.95	2.35	JAN	0.54	0.65	20.00	HWP
15.8	123	281 -104	JUL85	1.23		1.77	1.80	JAN	0.31	0.30	15.00	PKN
17.8	138	222 - 73	MAY85	4.44		4.41	3.00	NOV	0.60	0.99	8.00	TEK
NM	NM	NM - 90	MAR85	1.23		2.15	-0.75	DEC	0.29	0.50	20.00	AMD
41.5	324	NM -135	DEC84	1.53	0.08	0.04	0.65	DEC	-0.10	0.20	20.00	INTC
19.4	151	202 - 75	DEC84	2.95		0.40	1.80	DEC	0.16	0.73	15.00	MOT
NM	NM	NM - NM	MAY85	0.66		0.48	-1.50	NOV	-0.37	0.10	10.00	NSM
20.9	163	340 - NM	DEC84	13.05	1.50	-3.86	4.70	DEC	-0.74	2.64	12.00	TXN

Stock Research

Strategy Systems

November 11, 1985

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Valuation Focus — November 1985

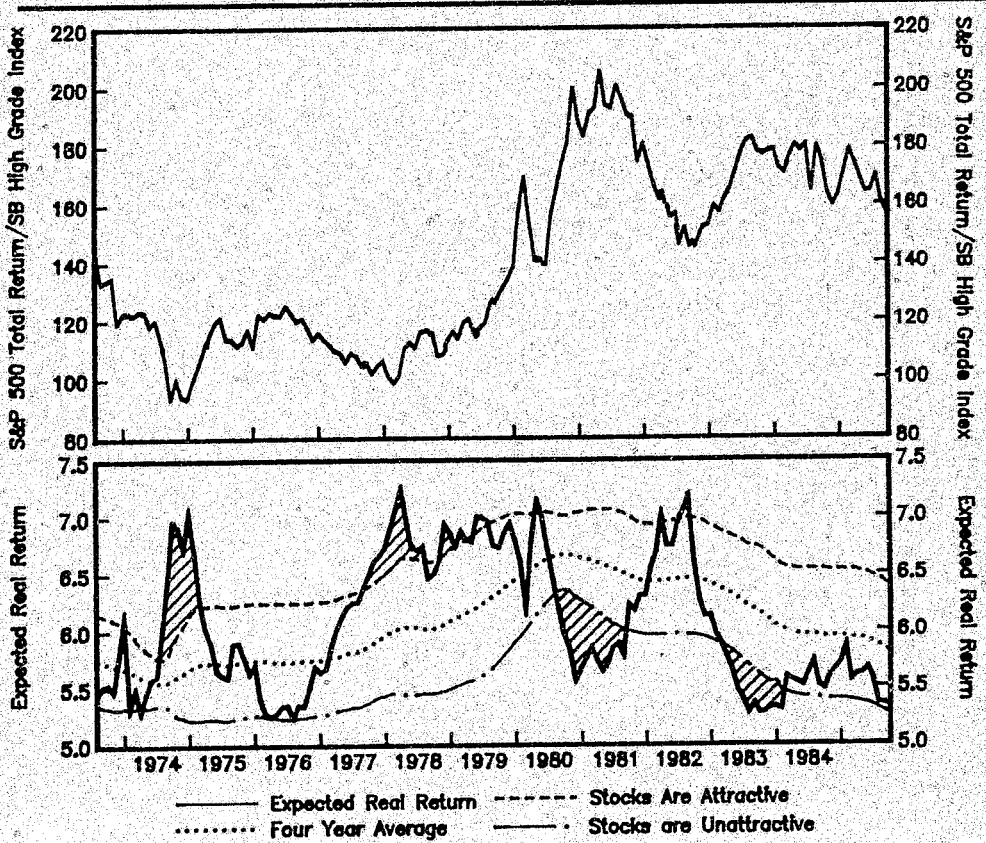
This month we introduce a new format for Expected Real Return (ERR) chart (Figure 1). The new feature is that the ERR is plotted with a series representing the relative performance of the total return of the S&P 500 against the total return of the Salomon Brothers high-grade index of long-term bonds. We believe that this representation more clearly presents the historical record of the ERR and its current forecast.

When the top line in Figure 1 is trending upward, stocks are outperforming bonds; when it is declining, bonds are outperforming stocks.

Since both components of this series are total returns, one can use values from the chart to draw conclusions about investment performance. For example, a tax-free investor who chose stocks instead of bonds in early 1978 would have had double the wealth of a bond investor in late 1980, as the index rose from 100 to 200. An investor who chose bonds over stocks at that point would have increased his wealth by about 65% relative to a stock investor. Both 1984 and 1985 have been better years for bonds than for stocks.

A high ERR should, in theory, identify when to prefer stocks to bonds. Conversely, a low ERR suggests that bonds will be the superior performers. Today's level is low but not alarmingly bearish; it simply suggests that rates of return on stocks and bonds are close, and that any advance in stocks will depend for fuel on declining long interest rates.

Figure 1. Relative Performance of Stocks versus Bonds, and Expected Real Return of the S&P 500, 31 Aug 73 - 30 Sep 85



A Comparison of Expected Returns

Figure 2 shows our estimates for the expected returns from stocks (as represented by the S&P 500), 20-year Government bonds and ten-year bonds denominated in European currency units (ECUs). The return for the S&P 500 was estimated using the projections shown for growth, earnings, dividends, and book value. Earnings and dividends are for the 12 months ending September 30, 1986, and do not match Salomon Brothers's calendar-year estimates.

Figure 2. Expected Returns of Asset Classes in Several Scenarios

		Rates		U.S. Dollar		GNP	
	Current	+100bp	-100bp	+5%	-5%	+½%	-½%
S&P 500	12.0%	-10.5	23.2	10.5	13.5	15.0	9.0
Govt 20-Yr Par Bonds	10.6	3.1	19.2	10.6	10.6	10.6	10.6
ECU 10-Yr Par Bonds	9.0	3.3	15.2	4.0	14.0	9.0	9.0
Assumptions for S&P 500							
Return on Equity (ROE)						13.6%	
Growth Rate (g)						7.7%	
Price/Book Ratio (PB)						1.4	
Earnings Per Share						$18.00	
Dividend						8.00	

The first column of Figure 2 shows the expected returns if there is no change in today's level of interest rates, gross national product (GNP) expectation, or exchange rates. The rest of the columns then show the base rates modified by the estimated impact of a shift of 100 basis points in rates, a rise or fall in the U.S. dollar versus the ECU, or a revision of expectations for GNP growth.

The striking feature of the first column is the small size of the differential between stocks and 20-year Government bonds. There is no historical record of ECU bond returns, but the spread between ten-year ECUs and 20-year Governments seems plausible; yet, that between stocks and bonds seems low. A substantial data base of differentials between realized returns on stocks and bonds exists, and a study by Ibbotson corrects those spreads for apparently unanticipated depreciation of bonds. By those standards, the current spread between stocks and bonds is narrow, and may result from two factors: Shifting volatility relationships and a good opportunity to buy bonds in preference to stocks.

The alternative scenarios shown in Figure 2 illustrate asymmetries between the response of stocks, bonds and ECU bonds to shifts in certain key variables. In the case of rates, for example, a downward shift would produce fairly similar positive returns for both stocks and bonds, while rising rates would be significantly worse for the stock market than for the bond market. A decline of 5% in the U.S. dollar-ECU exchange would give ECU bonds a favorable return.

Any combination of circumstances is possible, at least in theory. Rates could fall or rise, the dollar could fall or rise, and GNP expectations could wax or wane. In practice, falling rates, a falling dollar and better growth seem to go together to make a bullish scenario, while the flip side of those expectations describes the bear case.

Our strategy is predicated on the assumptions of flat rates, a declining dollar and slightly diminished enthusiasm with respect to GNP growth. That is, we believe that corporate profit growth over the next five years will modestly disappoint investors. We think that the column headed "Dollar -5%" has a reasonable claim to being the most probable outcome. Given the constraints of most institutional portfolios, we think that our recommended mix of 20% ECU-denominated ten-year bonds and 80% stocks is realistic and achievable.

Bad News Travels Slowly

We have been tracking the changing Wall Street expectations for corporate earnings all year. At the beginning of the year, the consensus economic expectation was for flat corporate profits. The corporate profits outlook has been modestly trimmed during the year, so that today's consensus expects a 5%-8% decline from calendar 1984. Meanwhile, Wall Street analysts were making and revising their earnings forecasts. It is always entertaining and sometimes instructive to aggregate these forecasts to make a "bottom-up" estimate for the S&P 500.

We do this by multiplying each company's earnings per share estimate by the number of shares outstanding to give a dollar figure of earnings available to common shareholders. We then sum that for all companies and compare it with the number reported in 1984. The results are shown in Figure 3.

Figure 3. Downward Revisions of Earnings Forecasts in 1985

Comparison of Estimates at 15 April versus 15 July and 31 Oct

		I/B/E/S			
Last Year		**Low**	**Median**	**High**	**Salomon Brothers**
Percentage Change (versus 1984)	14 Apr	-2.9%	10.8%	26.1%	7.6%
	15 Jul	-6.5	6.7	22.3	4.0
	31 Oct	-11.5	-0.2	11.2	-1.6
Weighted Growth Estimate	15 Apr	5.2	9.9	14.8	NA
	15 Jul	4.8	9.7	14.9	NA
	15 Oct	4.1	9.5	15.4	NA

NA Not applicable.

Consider the bottom-up estimate made from the I/B/E/S median forecasts. At April 15, this estimate called for a year-to-year earnings increase of 10.8%. By mid-July, the expected rise had slipped to 6.7%, and by the end of October, to -0.2%. Obviously, estimate cuts are the means through which this happens — and there have been plenty of them this year. We do not have the data in a form that allows us to make an exhaustive test, but partial evidence suggests that the median estimate has been cut more than once this year for over 60% of the S&P 500 companies. This fact alone illustrates the strong dependence of 1985's market on discounting rates. This has been a year of rising stock prices, and stocks have nearly kept pace with bonds despite continuing earnings disappointments. This can only be attributable to more bullish growth expectations or declining discounting rates, and we believe that the answer is the latter.

Should the "Equity Risk Premium" Be Zero?

The spread between the expected return of stocks and bonds is sometimes referred to as the equity risk premium, an appellation that we have always disliked, because it implies that the nature of this spread is well understood.

varied widely and has defied explanation in terms of interest rate levels, inflation and numerous other factors.

It seems plausible, however, that the volatility of returns of stocks and bonds should influence the relationship of their expected returns. Certainly the past few years — during which we have seen close stock/bond tracking and high real returns on bonds — have witnessed exceptional bond volatility. Figure 4 shows the volatility of stocks and bonds expressed as the annualized standard deviation of quarterly total returns on the S&P 500 and long Governments. It confirms what many have argued: Bond markets have become so jumpy that their risk reaches or exceeds that of stocks.

Figure 4. Volatility of Stocks Versus Bonds, 1 Jan 81 - 30 Sep 85

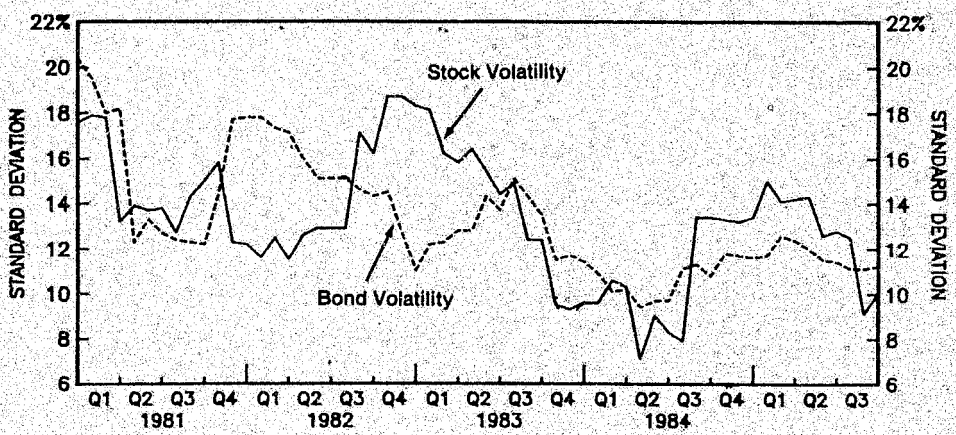


Figure 4 also reveals another datum, one that does not at all correspond with conventional wisdom. The volatility of stock returns has diminished to a mere 10% annually. Over the past three years, the highest level that this value has reached is 16%. Those who are used to considering the annual standard deviation of stock returns as permanently fixed at 20% may find this surprising. In fact, the high to low range of the S&P 500 in 1983, 1984 and 1985 has been less than 20%.

Equally contrary to conventional wisdom is the corollary observation that the volatility of stocks does not seem to be enhanced by activity in futures contracts. Not only has the annual volatility of stock returns been in a downtrend since 1980, but the daily and weekly volatility has declined as well. Our investigations of this have not turned up one statistical measure that identifies the supposed additional risk that futures trading injects into the stock market. Until such a measure can be verified, we regard the press commentary about this "threat" as unsupported and idle.

Current S&P 500	192
Exposure to Stocks (Max 100%, Min 70%)	80%
	balance of 20% in European Economic Community ECU-denominated 9.875% due 1996

Economic Exposure

GNP Sensitive	Match Market
Interest Sensitive	Match Market
Defense Sensitive	Match Market
Oil Price Sensitive	Underweight
Inflation Beneficiaries	Slightly Overweight

Changes to Recommended List

Added

Honeywell Inc
Computer Sciences Corp
Hartmarx Corp
Zurn Industries Inc
Coors (Adolph) Co
Shoney's Inc
Meredith Corp
Jim Walter Corp
Sealed Power
Interco
Warner-Lambert
Great Atlantic & Pacific Tea

Deleted

CSX Corp
Libbey Owens Ford
Limited Inc
Springs Industries Inc
Household International
Bemis Co
Chicago Pneumatic Tool
Tenneco Inc
National Gypsum Co
Williams Cos

Name	Price	Estimated 1985 Earnings	Estimated 1985 Dividend	Cap Decl	P/B Decl	Expected Return
Public Service Co of Ind	$8.875	$1.05	$1.00	2	1	38.11%
Honeywell Inc	62.125	6.95	2.00	7	3	21.51
JCPenney Co	48.625	5.90	2.36	8	2	20.25
Manuf Hanover Corp NTS	39.875	6.25	3.20	5	1	20.01
Archer-Daniels-Midland	22.750	2.25	0.14	6	4	19.19
Tonka Corp	23.875	4.50	0.09	1	8	19.16
Computer Sciences Corp	28.000	1.63	0.00	2	7	18.08
Hartmarx Corp	34.500	3.42	1.28	2	4	17.99
Zurn Industries Inc	39.250	3.02	1.32	1	5	17.60
General Dynamics	64.500	9.00	1.00	7	8	17.00
Sperry Corp	47.000	5.25	1.92	7	1	16.73
Fruehauf Corp	22.375	4.38	0.70	2	1	16.56
Ahmanson (H.F.) & Co.	38.000	6.75	1.20	4	2	16.55
U.S. Steel Corp	26.625	3.95	1.20	7	1	16.50
Coors (Adolph) Co-Cl B	16.750	1.40	0.40	2	1	16.42
Shoney's Inc	25.000	1.30	0.15	3	9	16.31
Meredith Corp	64.750	4.59	1.00	3	7	16.24
Kaufman & Broad Inc	14.000	2.10	0.40	1	1	16.23
AMR Corp-Del	39.625	6.40	0.00	6	3	15.76
Royal Dutch Pete-NY Gldr	63.875	10.75	2.61	9	2	15.64
Reynolds (R.J.) Inds	24.875	3.50	1.48	9	5	15.58
Walter (Jim) Corp	36.875	4.60	1.40	3	2	15.43
Federal Express Corp	46.375	3.00	0.00	6	8	15.39
Brunswick Corp	38.625	4.72	1.00	3	5	15.17
Great Atlantic & Pac Tea	18.125	1.45	0.00	3	3	15.16
Allied Stores	58.625	5.90	2.12	4	3	14.95
Bank Boston Corp	53.375	6.15	2.40	4	1	14.61
Warner-Lambert Corp	37.500	3.10	1.56	7	6	14.59
Sealed Power	23.750	2.70	1.00	1	3	14.30
North American Coal	65.000	7.85	1.10	1	5	14.26
Interco Inc	67.000	5.75	3.08	4	2	13.98
Dana Corp	23.500	3.15	1.28	5	2	13.92
Owens-Illinois Inc	50.625	5.16	1.80	5	2	13.85

Explanation of Columns

Est Earns and Est Div are 1985 estimates from the Salomon Brothers STOCKFACTS data base. CAP Rank is the ranking by market capitalization within the 365 stocks of the S&P 500 that have five years of positive earnings in our data base. A low ranking means a small market value, and vice versa. P/B Decile is the ranking by price/adjusted book value. Expected Return is the expected return as estimated by our T-Model.

The T-Model is an equation that estimates the total expected return from stock using an estimate of return on equity (ROE), the company's growth rate (g) and the price/book ratio (PB):

$$T = g + \frac{ROE - g}{PB} + \Delta \frac{PB}{PB} (1 + g)$$

Selection Rules

All stocks were selected from the S&P 500 Index — each from a different S&P industry category. Primary selection criteria were value, as reflected by our T-Model and our asset valuation criterion, and relatively small market capitalization. Criteria are chosen and weighted to match the style and factor exposure that we believe is most appropriate to current market conditions.

Forecasts of earnings, dividends and future growth are calculated by Salomon Brothers and are from consensus data (principally Zacks & Co.). Our recommended list will be published monthly and may be updated at more frequent intervals by special publications. The list will probably exhibit fairly high turnover during the course of a year. If a stock is removed from this list, valuation data may continue to be available upon request.

* * * * *

Q.5. Identify and describe in detail all computational models - including especially Limerick or nuclear project generic costs and schedule models, regression analyses and any other quantitative or statistical models or analyses which each witness identified in response to Interrogatory 1, above, will use or used or considered for use in connection with the preparation of your case, whether or not such models and analyses will be presented as evidence.

A.5. Mr. Kelley has not relied on any computational models. Mr. Winter relies on a multi-stage version of the Discounted Cash Flow (DCF) model. The DCF model is described in Mr. Winter's direct testimony.

Q.6. Provide the basic logic, statistical equation(s) and data base(s) for each model and analysis identified in response to Interrogatory 5, above. Logic and data bases should specifically include all activities and related durations, manhours, quantitates, costs, dollars and all other relevant measures used to described or quantify events and activities, should be provided in the following formats:

(a) Hardcopy logic diagram(s) including all nodes and activities;

(b) Hardcopy tabular listings(s);

(c) Magnetic media such as, but not limited to, floppy disks or tape;

(d) Any other machine readable or hard copy format available.

A.6. The data inputs to Mr. Winter's DCF model and model logic, are described in his testimony. Neither logic diagrams, nor tabular listing of this model (in hardcopy or magnetic media form) are available.

Q.7. For each model and analysis identified in response to Question 5, above, state:

(a) When the model or analysis was developed;

(b) Who developed the model or analysis and, if developed by the expert or his or her organization or employer, provide copies of all workpapers or other source documents relied upon in developing that model or analysis;

(c) Whether the model or analysis is computerized and, if so, described the software used, including, but not limited to, the language utilized, size in terms of linear code and computer memory, type of machine currently utilized to operate the model or perform the analysis any commercial name or other applicable label, and other information or data required to completely and accurately identify the software utilized;

Q.8. To the extent not included in response to a prior Interrogatory, provide for each model or analysis identified in response to Interrogatory 5, above:

(a) The applicable user's guide and documentation;

(b) All inputs used, including computer commands;

(c) All outputs derived therefrom:

(d) The model code; and

(e) All other relevant information and data needed to fully understand and operate the model or perform analyses through its use.

A.8. Inputs to, and results from Mr. Winter's application of his DCF model are contained in his direct testimony. A users guide to the DCF model has not been prepared. All information necessary to understand and verify model results is contained in Mr. Winter's testimony.

Q.9. For each model and analysis identified in response to Question 5, above, identify all modifications or adjustments made to account for Limerick-specific events, activities or factors, and describe in detail the specific changes.

A.9. N/A

RECEIVED

JAN1 0 1986

SECRETARY'S OFFICE
Public Utility Commission

BEFORE THE
PENNSYLVANIA PUBLIC SERVICE COMMISSION

In the Matter of the:
Application of The Bell Telephone Company of Pennsylvania
for authority to increase existing rates
and charges for telephone service

Docket No. 2779

Direct Testimony of

PHILIP R. WINTER

COST OF CAPITAL

General Services Administration
on behalf of the Federal Executive Agencies

General Services Administration (PUR)
18th & F Streets, N.W.
Washington, DC 20405
(202) 566-0277

May 10, 1985

Q: PLEASE STATE YOUR NAME AND YOUR BUSINESS ADDRESS.

A: My name is Philip R. Winter. My business address is Office of Public Utilities, Rate Case Division, General Services Administration, 18th and F Streets, N.W., Washington, DC 20405.

Q: WHAT IS YOUR POSITION WITH THE GENERAL SERVICES ADMINISTRATION?

A: I am an Operations Research Analyst in the Office of Public Utilities responsible for cost of capital and cost of service testimony in public utility rate cases. A statement of my educational background and professional experience is contained in Appendix A of this testimony.

Q: IN WHAT CAPACITY ARE YOU APPEARING BEFORE THIS COMMISSION?

A: I am appearing as a witness on behalf of the General Services Administration, representing the consumer interests of all Federal Executive Agencies including the Department of Defense.

Q: WHAT IS THE PURPOSE OF YOUR TESTIMONY HEREIN?

A: I address cost of capital issues, including The Bell Telephone Company of Pennsylvania's (Company) cost of debt, cost of common equity, and appropriate capital structure.

Q: WHAT OVERALL COST OF CAPITAL IS APPLICABLE TO THE COMPANY IN THIS CASE?

A: The Company's overall cost of capital applicable to the test year ending September 30, 1985, is 11.20%. The capital structure utilized in calculation of this overall cost along with my recommendations on the cost of long-term debt, short-term debt, and common equity components of the structure are shown in GSA Exhibit (PRW-1).

Q: WHAT COST HAVE YOU DETERMINED APPLICABLE TO THE LONG-TERM DEBT COMPONENT OF THE COMPANY'S CAPITAL STRUCTURE?

A: The cost of long-term debt shown in GSA Exhibit (PRW-1) is the estimate provided by Company witness Girard in his prefiled testimony. His 8.62% figure anticipates no new long-term debt offerings nor debt acquisitions by the Company. Given the absence of current debt financing plans of the Company, I recommend acceptance of the 8.62% figure.

Q: WHAT COST IS APPLICABLE TO THE SHORT-TERM DEBT OF THE COMPANY'S CAPITAL STRUCTURE?

A: First quarter 1985 yields on prime (i.e. P-1) commercial paper have averaged 8.4% and the Company's actual experience in 1985 has been yields between 8.28% and 8.59% (Tr. 141). Consensus forecast yields through the third quarter of 1985 range between 8.3% and 8.6%, based on the Blue Chip Financial Forecasts, dated May 1, 1985.

I have concluded, based on these forecasted and recent actual yields on short-term debt, that Mr. Girard's revised estimate of 10.00% (Tr. 138) is excessive. Absent significant changes in short-term yields, the appropriate cost of the Company's short-term debt is 8.50% (the average of recent actual and forecasted yields for the test year).

Q: WHAT CONCLUSION HAVE YOU REACHED CONCERNING THE COST OF THE COMPANY'S COMMON EQUITY?

A: The current cost of the Company's common equity, is between 12.74% and 14.05%. In today's capital market, I consider the midpoint of this range, 13.40%, a reasonable point estimate of the cost of equity. Documentation of my analysis of the Company's cost of equity is contained in the following pages.

Q: WHAT CRITERIA HAVE YOU UTILIZED TO DETERMINE THE CURRENT INVESTOR REQUIRED RETURN FOR THE COMPANY?

A: I have applied the criteria established by the Supreme Court in the Bluefield and Hope decisions. In Bluefield Waterworks & Improvement Co. v. Public Service Commission of West Virginia, 262 U.S. 679, 693 (1923), the Court stated:

> "The return should be reasonably sufficient to assure confidence in the financial soundness of the utility and should be adequate, under efficient and economical management, to maintain and support its credit and enable it to raise the money necessary for the proper discharge of its public duties."

In addition, as an indication of an upper bound on the return and the potential instability of investor return requirements, the Court stated (262 U.S. AT 692, 693):

> "...[the company] has no constitutional right to profits such as are realized or anticipated in highly profitable enterprises or speculative ventures."

"A rate of return may be reasonable at one time and become too high or too low by changes affecting opportunities for investment, the money market and business conditions generally."

The Hope decision (FPC v. Hope Natural Gas Co., 320 U.S. 591, 603 (1944)) provided guidelines similar to those that I initially related from the Bluefield opinion, as follows:

"...the return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital."

Q: DO THE CRITERIA STATED IN THESE SUPREME COURT DECISIONS INDICATE UPPER AND LOWER BOUNDS FOR THE COST OF EQUITY?

A: In a general sense, they do. The lower bound is established as the return sufficient to maintain the Company's credit in the marketplace. Indications of the sufficiency of the return are the Company's success in raising necessary capital and the similarity of the after tax return to that after tax return on other investments of corresponding

risks. Certainly investors' capital will be attracted by those firms of corresponding risk that offer the higher after tax returns. Unless the return offered by the regulated utility is competitive, the capital attraction criterion is unlikely to be met.

r The upper bound on returns is stated to be below that realized or anticipated from highly profitable enterprises or speculative ventures. For high-grade utility firms, without consideration of the company's specific risk level, I believe yields-to-maturity on bonds rated below BBB by Standard & Poor's or Baa by Moody's, may be used as an indicator of this upper bound. Such bonds are considered to be "predominantly speculative" or have "speculative elements" according to these rating services and offer returns in excess of that generally required in the market-place.

Q: GIVEN THE GENERAL SUPREME COURT GUIDELINES, HOW HAVE YOU DETERMINED SPECIFIC BOUNDARIES FOR THE COST OF THE COMPANY'S EQUITY?

A: I have first reviewed macroeconomic conditions that define the environment for today's credit market. Included in this review were expectations for, and recent trends in, the inflation rate, current Federal Reserve policy on monetary

growth, and loan demand at large commercial banks. These interrelated factors are primary determinants of the cost of money. Secondly, I have performed a current market analysis of utility stocks, in general, and of a proxy for the Company's common stock (the Company's stock is not traded) to determine the Company's current cost of equity. Finally, I have reviewed cost of capital trends to draw conclusions about the prospective cost of the Company's equity for the period during which rates from this case will be in effect.

Q: WHY DO YOU BEGIN YOUR ANALYSIS OF THE COMPANY'S COST OF EQUITY WITH A REVIEW OF CURRENT MACROECONOMIC CONDITIONS?

A: As indicated above, macroeconomic conditions including the supply and demand for funds in the U.S. economy and the rate of inflation are primary determinants of the general rates of interest (costs) on borrowed or invested capital. These general costs establish the base from which a specific company's cost of capital is determined.

Q: HOW ARE THE FEDERAL RESERVE'S MONETARY POLICY, THE INFLATION RATE, LOAN DEMAND, AND THE COST OF MONEY RELATED?

A: The interrelationships of these factors are multifaceted and complex. In basic terms, however, a tight monetary policy with stable loan demand tends to decrease the rate of

inflation and place upward pressure on interest rates in the short-term. Over the long-term, interest rates would be expected to decline as inflationary pressures cool. Similarly, a policy toward increasing monetary growth with stable loan demand has tended to reduce interest rates over the short-term (due to the more plentiful supply of money), but exert upward pressure on the inflation rate. Over the long-term, interest rates would be expected to rise with the increasing rate of inflation. Short-term effects of monetary growth on interest rates may be lessened or increased by fluctuating loan demand.

For example, heavy demand for business loans during the first quarter of 1985 (loan growth at a 9% annual compound rate) placed upward pressure on interest rates even with relatively rapid growth in the money supply (9% growth in M 1).

Q: WHAT HAS BEEN THE RECENT MONETARY POLICY OF THE FEDERAL RESERVE?

A: Recently stated goals of the Federal Reserve are "to foster monetary and financial conditions that will help to reduce inflation further, promote growth in output on a sustainable basis, and contribute to an improved pattern of international transactions." To achieve these goals, the

Federal Reserve has allowed monetary growth somewhat above its 1985 target growth range of 4% to 7% (for M 1). More recently, however, monetary growth has been restrained and growth for the year as a whole is expected to be within the target range.

Primary concerns of the Federal Reserve's policy committee include the large Federal deficit, the strength of the dollar and its effect on American exports, and the potential for renewed inflation. The first two concerns (the deficit and strength of the dollar) may be alleviated over the short-term by more rapid monetary growth, i.e., higher monetary growth would likely reduce interest rates thereby easing the pressures of Federal borrowing and reducing the attractiveness of the dollar. Higher monetary growth may, however, reignite inflation. In an attempt to walk the fine line between a policy that is noninflationary and simultaneously sufficient to stimulate exports (lessen the dollar's value overseas) and finance the deficit, the Federal Reserve appears to be allowing monetary growth near the upper end of its target range while keeping a watchful eye on inflation trends. Unless the inflation rate begins to rise, higher monetary growth will likely be tolerated.

Q: WHAT HAS BEEN THE IMPACT OF LOAN DEMAND, RECENT FEDERAL RESERVE POLICY, AND OTHER SIGNIFICANT FACTORS ON THE CREDIT MARKETS?

A: Recent interest rates on bonds and other fixed yield investments are shown in GSA Exhibit (PRW-2). Average yields on fixed income securities trended downward from the summer of 1984 through January 1985. Fixed income security yields dropped 150 to 350 basis points during this period. The Federal Reserve's restraint on monetary growth and increased loan demand in early 1985 subsequently led to a plateau in yield trends followed by increases of 50 to 100 basis points. In late March and April 1985 yield trends turned flat again and currently remain 100 to 300 basis points below their 1984 highs. Contributing to the general declining trend in fixed income yields has been heavy foreign investment in U.S. securities, moderate levels of unemployment, and noninflationary levels of U.S. capacity utilization.

Q: HAVE INFLATION RATES ALSO BEEN IMPACTED BY FEDERAL RESERVE POLICY?

A: Yes, they have. The consumer price index (CPI) dropped an amazing 12 percentage points (15% to 3%) between its peak in 1980 and a relative low in 1983 (see GSA Exhibit (PRW-3),

Part I). Since the 1983 low, inflation rates have risen to a level near 4% and fluctuated narrowly around this level. Inflation rates recorded during the first two months of 1985 were 2.4% and 3.7%, respectively, on an annualized basis.

Although other independent factors such as declining oil prices and the strength of the dollar against foreign currencies have contributed to favorable inflation rate trends, Federal Reserve action has been given a major portion of the credit for bringing inflation under control.

Q: WHAT IS THE CURRENT OUTLOOK FOR INFLATION?

A: Expectations for future inflation are commonly believed to be based on historical rates with the more recently experienced rates of increase carrying the greatest weight. The pattern of inflation has stabilized since early 1984, and current low levels of inflation are generally expected in the coming months. According to the April 10, 1985 issue of Blue Chip Economic Indicators, the consensus forecast by top economists for price inflation during 1985 is 3.7%. Similar forecasts for 1986 indicate expectations for consumer prices to rise at a 4.6% annual rate. Recent inflation forecasts by major forecasting firms are shown in GSA Exhibit (PRW-3), Part II. Inflation rate expectations of these forecasters range between 3.2% and 6.0% during

1985-86.

The Blue Chip forecast for 1985 inflation is further supported by the Federal Reserve's Open Market Committee and survey results published in Business Week's, 1985 "Scoreboard Special". This latter source indicates an average 1985 inflation forecast from twenty-seven economist of 4.0% and twelve econometrics services of 3.9%.

Q: WITHIN THE SCENARIO DESCRIBED ABOVE OF M 1 GROWTH WITHIN THE FEDERAL RESERVE TARGET RANGE OF 4% TO 7% AND A PLATEAU IN INFLATION RATE TRENDS, WHAT IS THE OUTLOOK FOR THE COST OF CAPITAL?

A: If inflation continues to fall near 4% and credit demands are consistent with allowed monetary growth without oil, or other, price shocks, interest rates should decline. Alternatively, more restrictive monetary growth coupled with strong demands for credit will exert upward pressure on current rates. As reflected in the May 1, 1985 issue of Blue Chip Financial Forecasts, the consensus opinion is for little change in capital costs with seasoned Aa utility bond rates dropping from the most recent actual yield of 12.8% to 12.5% during the second quarter of 1985 and remaining at that level through 1985 and early 1986.

Q: WITHIN THE CURRENT ENVIRONMENT CHARACTERIZED BY INFLATION EXPECTATIONS NEAR 4% AND A MODERATE FEDERAL RESERVE MONETARY POLICY, WHAT HAS BEEN THE PERFORMANCE OF TELEPHONE UTILITY STOCKS IN GENERAL?

A: Telephone utility stock price trends, as indicated by a composite index of the Regional Holding Companies (RHC), is shown graphically in GSA Exhibit (PRW-4) for the period January 18, 1985 to May 3, 1985. This index reflects significant upward price movements. On average, the index has jumped 9.1% during the 16-week period. The recent strong market for these stocks has been attributed to continuing low levels of inflation, declining interest rates, and strong earnings growth.

Q: HAS THE COMPANY'S PERFORMANCE BEEN SIMILAR TO THAT OF THE REGIONAL HOLDING COMPANIES?

A: The Company's common stock is fully owned by Bell Atlantic and not traded in the marketplace. Therefore no direct indication of its performance is available from the stock market. Bell Atlantic's market performance may, however, be used as a proxy for the Company's unless its fundamental characteristics, based on accounting and other data, differ significantly from those of Bell Atlantic. I have found no such differences. Therefore, I will rely on Bell Atlantic

as a proxy for Bell of Pennsylvania.

Q: WHAT HAS BEEN THE RECENT PERFORMANCE OF BELL ATLANTIC'S STOCK RELATIVE TO THE RHC'S AND RELATIVE TO BOOK VALUE?

A: GSA Exhibit (PRW-5) shows Bell Atlantic's stock price trend to be similar to that of the RHC Index. Price appreciation for the stock since the beginning of the 16-week period has been 10.8%, somewhat above that of the index.

Bell Atlantic's price performance also compares favorably to book value. As of April 30, 1985, its price exceeded book value by approximately 14% (based on Value Line's book value projection for end-of-year 1985 and actual 1984 end-of-year book value).

Q: OF WHAT IMPORTANCE IS BELL ATLANTIC'S RECENT STOCK PRICE TREND TO YOUR DETERMINATION OF THE COMPANY'S RETURN REQUIREMENTS?

A: Stock prices carry information concerning investor return expectations and requirements. Prices recorded for Bell Atlantic's stock represent the consensus opinion of the marketplace as to the stock's value given the current and prospective growth expectations and discount rates.

Theoretically, a stock's value is equal to the present value of expected future returns from investing in the stock. The future returns are in the form of dividends and price appreciation. From a knowledge of investors' expectations for dividend growth and price appreciation, investor return requirements may be estimated. By adjusting investor return requirements for the effects of flotation cost and market pressure (if any), Bell Atlantic's return requirements on equity may be estimated.

Q: IN GENERAL, WHAT IS THE RELATIONSHIP BETWEEN A COMPANY'S STOCK PRICE TREND AND INVESTOR RETURN REQUIREMENTS?

A: In general, increasing stock price trends in the short-term are a result of an increase in expected returns from the stock or a decline in investor return requirements. Similarly, decreasing stock price trends imply decreasing expected returns or rising required returns. This generalization assumes that investors' growth expectations do not change in the period of consideration.

Q: YOU PREVIOUSLY STATED THAT THE COMPANY'S FUNDAMENTALS, AS INDICATED BY ACCOUNTING AND OTHER DATA, SHOULD BE SIMILAR TO THOSE OF BELL ATLANTIC FOR THE LATTER COMPANY TO BE A REASONABLE PROXY FOR THE FORMER. HOW DOES THE COMPANY'S RECENT OPERATING PERFORMANCE AND BOND RATING COMPARE WITH THAT FOR BELL ATLANTIC AND ITS COMPONENT PARTS?

A: The Company's bond rating (Aa2) is somewhat above the average rating assigned to the seven Bell Atlantic telephone operating companies. According to this indicator, Bell of Pennsylvania is slightly less risky than Bell Atlantic's regulated component parts. In terms of variability for 1984 operating revenues and net operating income, the Company's risk ranking is slightly below average based on the coefficients of variation (standard deviation divided by the average of 1984). Although longer-term post-divestiture data are needed for a more thorough analysis of risk comparability, such data are not available. Given that the parent company will likely be the source for satisfying equity needs of the Company and that longer-term data are not available, use of Bell Atlantic as a proxy for the Company is reasonable at this time.

Q: DOES BELL ATLANTIC'S RECENT OPERATING PERFORMANCE COMPARE FAVORABLY WITH OTHER COMPANIES OF CORRESPONDING RISKS AND WITH LARGE CORPORATIONS IN GENERAL?

A: A review of fundamental ratios indicative of Bell Atlantic's recent performance as show in GSA Exhibit (PRW-6) reveals the following. Bell Atlantic's 1984 after tax profit margin (12.0%) is slightly above the average margin (11.8%) for the seven RHCs. Although the Company's return on equity for 1984 (13.0%) is 10 basis points below the RHC average, this lower rate of return is due to Bell Atlantic having less leverage (total capital divided by total equity) and a lower after-tax flow-through rate (1-tax rate) than the average RHC, and is not due to inadequate profit margins (see GSA Exhibit (PRW-6) Part II).

GSA Exhibit (PRW-6) also contains comparative performance data for the large corporations covered by Business Week for the period 1981 through 1984. Bell Atlantic's margin for 1984 of 12.0% is approximately 2.4 times that of the highest margin recorded for large corporations during this period. Exhibit (PRW-6) Part I further shows that the margins for large corporations suffered during the recent recession, dropping approximately 16%. Although trend data on Bell Atlantic's margins are not available, regulated utilities in general have not experienced similar downturns in margins

and, in this respect have been less risky than the large corporations. The effects of regulation on Bell Atlantic and the other Regional Holding Companies (RHCs) should similarly result in lower inherent risk than that associated with Business Week's large corporations.

As for returns on end-of-year book equity, Bell Atlantic's return was only 20 basis points below the corporate average for 1984 and 150 to 200 basis points above that recorded by the large corporations in 1982 and 1983. Given the lower relative risk of Bell Atlantic, Bell Atlantic's return on equity for 1984 compares favorably with that earned by large corporations.

Q: WHAT METHODS HAVE YOU USED TO DETERMINE THE COST OF EQUITY TO BELL ATLANTIC AND, IN TURN, TO THE COMPANY?

A: To estimate return requirements, I rely most heavily on the discounted cash flow (DCF) approach, an approach that utilizes a company's stock price along with expectations for dividend growth and price appreciation, to estimate investor return requirements. For purposes of DCF analysis, I rely on Bell Atlantic's market data as a proxy for that of the Company. I also utilize a risk premium approach and a market-to-book ratio analysis to check the reasonableness of results from the DCF method.

Q: WHAT ASSUMPTIONS OR JUDGMENTS MUST THE ANALYST MAKE WHEN APPLYING THE DCF METHOD?

A: Primary assumptions in application of the DCF method are that the price paid for a security is an "equilibrium" price and is equal to the discounted stream of investor-"expected" dividends and price appreciation over the investor-holding period. The discount rate that equates a company's stock price to these expected returns is an indication of the investor-"required" rate of return. Algebraically, these assumptions may be expressed as show in GSA Exhibit (PRW-7).

Q: WHAT JUDGMENTS MUST THE ANALYST MAKE BEFORE APPLYING THE DCF MODEL?

A: To apply the DCF model, the rate of return analyst must make decisions about the following items:

1. What is the investor-expected growth in dividends during the investment horizon and does the expected growth rate change over time?

2. What stock price is representative of current investor return requirements, e.g., the price of the stock on a specific date; the average price over the most recent 12 weeks, 16 weeks, or other period?

3. What is the investor's expected holding period or investment horizon, i.e., the future period over which the investor makes assumptions about potential returns?

4. What is the expected change in the stock's price during the investment horizon?

Q: WHAT FORM OR VERSION, OF THE DCF MODEL HAVE YOU USED IN THIS CASE?

A: I rely on a "two-stage" model that allows explicit consideration of varying dividend growth rates over time.

Q: DOESN'T THE COMMONLY USED "YIELD PLUS GROWTH," i.e. D/P + g FORM OF THE DCF MODEL ALLOW CONSIDERATION OF GROWTH RATES THAT VARY OVER TIME?

A: No, it does not. The "yield plus growth" form of the DCF model is obtained from the longer version shown in GSA Exhibit (PRW-7) only if the assumption is made that dividends grow each year at a constant rate. In fact, if the D/P + g version is properly used, the analyst will concentrate on determination of an expected <u>long-term</u> growth rate as opposed to relying solely on near-term estimates. Strictly speaking, the growth rate used in this simple form of the model is assumed to continue through infinity without

change.

Q: WHAT OTHER ASSUMPTION ARE IMPLICIT IN THE CONSTANT GROWTH MODEL?

A: The constant growth DCF model also implicitly assumes that the market price, earnings and book value of the company's common stock each grow at the same constant rate as dividends. This assumption is a characteristic of the constant growth model even though a cursory review of individual utility companies' short- or long-term performance will show that these constant growth conditions are seldom experienced. If inaccuracies associated with the unrealistic constant growth assumption are to be minimized, the growth rate used must reflect the composite long-term growth expectations for all those elements i.e., price, dividends, earnings, and book value. Failure to consider composite growth rate expectations, especially for determination of long-term growth prospects, may lead to significant errors in DCF findings.

Q: WHY IS THE TWO-STAGE MODEL THAT CONSIDERS DIFFERING RATES OF GROWTH MORE APPROPRIATE THAN THE SINGLE-STAGE, OR CONSTANT GROWTH MODEL, IN ESTIMATING RETURN REQUIREMENTS?

A: The rate of utility company dividend and price growth has varied widely over past time periods. Although changes occur, from time to time, in the structure of the utility industry, I am aware of no such changes that have altered the prospective pattern of dividends and price growth. The investment community does, in fact, expect some variation in price and dividend growth over future holding periods. Given these expectations, a multi-stage DCF model that allows explicit consideration of varying growth rates is the more appropriate for use in estimating investor return requirements.

Q: WHAT HAVE BEEN THE PAST PATTERNS OF DIVIDEND AND PRICE GROWTH FOR TELEPHONE AND OTHER REGULATED UTILITIES?

A: Although historical growth rate trends are not available for the RHCs, dividend and price growth patterns of AT & T and Moody's Electrics provide insight into the variability that may occur. These 5-year holding period growth patterns are shown for 1955 through 1983 in GSA Exhibit (PRW-8).

The AT & T data show dividend growth rates varying between approximately 2% and 10% dependent on the holding period. Price growth rates have varied even more widely, with annual compound rates of growth ranging between -7% and +19%. Of equal significance from a DCF analyst's point of view, is the fact that price and dividend growth differ markedly over the same holding period. This fact is apparent from the graph in PRW-8 by noting that the plotted points don't, as a rule, lie along a 45° diagonal through the origin. As emphasized earlier, the DCF model growth rate(s) must be representative of expectations for both price and dividends. Concentration by the analyst on one of these inputs to the DCF model without consideration of the other, may lead to sizable errors in results.

Similar data for Moody's Electric utilities in GSA Exhibit (PRW-9) offer additional evidence of the likely variability in dividend and price growth rates over time and in dividend and price growth for the same holding period. This evidence again supports the appropriateness of a multistage DCF model and the need to consider expectations for the composite of dividend and price growth.

Q: WHY DO PAST PATTERNS IN PRICE AND DIVIDEND GROWTH AFFECT CURRENT INVESTOR EXPECTATIONS?

A: Investors learn from past experience and are aware of the historical swings in dividend and price growth rates. They will therefore temper their future expectations with this knowledge. Whereas over the near term, investors may expect continuation of relatively high rates of dividend growth, such growth is unlikely to continue over extended periods. This fact is fully supported by historical data. Similarly, investors do not expect unreasonably low growth rates to continue uninterrupted.

Q: IS THE TWO-STAGE, OR MULTISTAGE, DCF MODEL ACCEPTED IN THE INVESTMENT AND ACADEMIC COMMUNITIES?

A: Yes, it is. Kidder, Peabody; Prudential-Bache; Salomon Brothers; Drexel, Burnham and Lambert; Goldman, Sachs & Co.; and others currently use multistage, DCF models to estimate investor return expectations on common stock. Also academicians, such as David Hawkins of Harvard University, Eugene Brigham of the University of Florida, and Fred Weston of the University of California (Los Angeles), recognize the need for multistage models in texts they have authored.

Q: WHAT ARE THE BOUNDARIES OF THE TWO GROWTH PERIODS YOU EMPLOY IN THE DCF MODEL AND WHAT IS THE LOGIC FOR YOUR SELECTION OF THESE BOUNDARIES?

A: I recommend a DCF model of the following form:

$$P = \sum_{i=1}^{4} D(1+g_1)^i/(1+K)^i + \sum_{i=5}^{\infty} (1+g_1)^4(1+g_2)^{i-4}/(1+k)^i$$

where "P" and "D" are the current price and dividend, respectively, "g_1" is the average annual growth rate expected within the next four years, "g_2" the average annual growth expected over the long term, and "k" is the investor-required return.

The near-term boundary defines a four-year forecast period. Forecasts covering a period of this length are frequently published by investment services and are generally available to investors. Value Line, Dean Witter, Merrill Lynch, and Salomon Brothers are among the better known firms providing forecasts for this period.

Because of the broad circulation of such forecasts and the relative accuracy with which four-year forecasts may be made, I believe this period receives particular attention by investors. Forecasts and expectations beyond the three to five year period become less certain and may vary widely. Using the above rationale, I have selected a four-year period for the initial stage of the DCF model.

Q: ON WHAT DATA HAVE YOU RELIED TO ESTIMATE GROWTH RATES APPROPRIATE FOR USE IN THIS MODEL?

A: I rely on investment firm growth forecasts for Bell Atlantic for both the near- and long-term and on the implied growth rate from the first full year (1984) of Bell Atlantic's operating data. In addition, I have reviewed long-term growth histories for both regulated and unregulated firms.

Q: WHAT ARE INVESTMENT FIRM FORECASTS FOR BELL ATLANTIC GROWTH DURING THE FIRST STAGE OF THIS MODEL?

A: Relying on the most recent reports available from various investment firms, I have found the following. Value Lines's forecasts, dated April 26, 1985, indicate expectations for annual dividend, earnings, and book value growth from the beginning of 1985 to the end of 1988 to average 6.4%, 5.9%, and 5.2%, respectively. Prudential-Bache in its March, 1985

Quantum report, expects 5-year dividend and earnings growth of 5% and 7%, respectively. Merrill Lynch in its March 1985, Quantitative Analysis report projects five-year growth rates for dividends and earnings to be 6.8% and 8.2%, respectively. Salomon Brothers' April 15, 1985, Monthly Stock Review indicates expectations for 6.0% and 6.5% annual rate of growth for dividends and earnings during the next five years. ARGUS, in its March, 1985 Utility Scope publication, expects 6.6% annual growth in Bell Atlantic's earnings during 1985. Finally, Dean Witter's most recent 5-year growth forecast for Bell Atlantic is 6.0%. Near-term dividend growth rates estimated by these investment firms range between 5.0% and 6.8% and are summarized in GSA Exhibit (PRW-13).

Q: WHAT ARE YOUR FINDINGS FROM REVIEW OF SHORT-TERM HISTORICAL GROWTH RATES FOR BELL ATLANTIC?

A: At the end of the 1st Quarter 1985, Bell Atlantic increased its dividend from $1.60 per quarter to $1.70. No other company specific, actual growth data are available. This 6.25% increase is the first indication of management's policy toward dividend increases and will be viewed by some investors as an indication of future growth rates.

Q: WHAT IS YOUR CONCLUSION CONCERNING BELL ATLANTIC'S NEAR-TERM GROWTH RATE?

A: Based on review of forecasts from investment services and the lone indication of management's dividend growth policy, expectations for dividend growth vary between 5.0% and 6.8%. For purposes of DCF analysis in this case, I consider short-term growth rates of 6.0% to 6.25% to be representative of most investors' expectations for Bell Atlantic. The 6.0% figure is the average of the investment firm forecasts shown in GSA Exhibit (PRW-13). The 6.25% upper end of the range is supported by the recently recorded actual increase in Bell Atlantic's dividend. I employ this range of growth rates in the two-stage DCF model, along with long-term growth expectations, to estimate current investor return requirements.

Q: WHAT ARE INVESTORS' EXPECTATIONS FOR GROWTH DURING THE SECOND STAGE OF THIS MODEL?

A: Beyond the four-year period, it is unreasonable to believe that either unusually high, or unusually low, current growth is expected by investors over the long term. I therefore rely on investment firm forecasts of long-term growth potential and on actual long-term growth rates for regulated utilities and unregulated firms. Over the long-term, AT & Ts

(prior to divestiture) dividends and price grew at annual compound rates of approximately 5% and 3% respectively. The electric utility industry as represented by Moody's Utility Index, experienced annual growth rates in dividends and price over the long-term of approximately 3.0%. As for unregulated firms, the DOW Industrial Index has recorded long-term dividend and price growth rates of approximately 3.7% and 4.2%, respectively.

As for long-term growth forecasts from investment firms for Bell Atlantic, Merrill Lynch is the only firm that regularly makes such forecasts available. Its previously referenced March, 1985 report indicates long-term growth expectations of 5.6%. This figure is somewhat higher than the internal growth rate calculated using Bell Atlantic's retention ratio of 36%, based on 1984 actual data and Value Line projections, and its expected return on equity of 13%, i.e., .36x13=4.7%

The long-term growth histories and the investment firm forecast range between 3% and 5.6%. Relying on the long-term growth histories for indices of regulated and unregulated firms, I consider 4.0% the mid-point of the historical range to represent the lower end of the long-term growth rate appropriate for use in my two-stage model. Both unregulated firms and regulated telephone and electric utilities have demonstrated an ability to maintain long-term growth at this rate. I consider 5.6% reasonable for the upper end of my long-term growth rate range since it is consistent with the investment firm forecast and respresentative of more recent growth within the industry. The 5.6% rate exceeds the long-term experience of regulated utilities and is somewhat above current expectations for long-term price inflation and therefore may exceed actual long-term performance of the regulated telephone industry.

Q: WHAT IS THE CURRENT DIVIDEND YIELD TERM OF YOUR DCF EQUATION AND HOW WAS IT DERIVED?

A: The current dividend yield (D_o/P_o) is 7.85%. This yield is computed as the average of the quotients of end-of-week stock prices and effective dividend rates from the most recent 16-week period (1/18/85-5/3/85). A period of this duration is necessary to level the effects of temporary price fluctuations. Also the 16-week period, as opposed to a shorter period, is less likely to be fully contained within a peak or valley in the price pattern.

If significant trends in price movement are observed during the period, information conveyed by these trends should be incorporated in the final decision concerning the cost of equity. Bell Atlantic's stock price varied from $78.625 to $87.375 during this period, based on end-of-week prices, and the indicated annual dividend was increased from $6.40 (4x$1.60) to $6.80 (4x$1.70) per share.

Q: WHAT ARE YOUR CONCLUSIONS FROM THE TWO-STAGE DCF MODEL CONCERNING INVESTOR RETURN REQUIREMENTS ON BELL ATLANTIC'S STOCK?

A: A current dividend yield of 7.85% coupled with near- and long-term expected growth rates of 6.0% to 6.25% and 4.0% to 5.6%, respectively, indicate investor requirements of between 12.74% and 14.05%. In terms of the "yield plus growth" or "constant growth" model, my analysis indicates investors expect constant annual dividend and price growth rates between 4.5% and 5.7%, i.e., .1274=.0785(1.045)+.045 and .1405=.0785(1.057)+.057.

Q: WHAT ARE THE POINTS OF DISAGREEMENT BETWEEN YOUR DCF RESULTS FOR BELL ATLANTIC, AND THOSE OF MR. BRENNAN?

A: Mr. Brennan's DCF finding of a 14.9% cost of equity for Bell Atlantic (Brennan Exhibit 1, Part 1, p. 1) is based on an average dividend yield of 8.8% and average growth rates ranging between 5.8% and 6.4%. Although Mr. Brennan claims to have used a two-stage DCF model, his DCF end result is obtained by simply adding a dividend yield term to a constant growth rate term (Brennan Exhibit 1, Part 1, p. 1 paragraphs II K and III. C.). His finding of an 8.8% yield and a growth rate range of 5.8% to 6.4% therefore fully determine his DCF findings for Bell Atlantic, i.e., 8.8+5.8=

14.6% and 8.8+6.4= 15.2% for and average cost of equity of 14.9% [(14.6+15.2)/2 = 14.9%]. Since he has, in effect, applied a constant growth model, his growth rate range must represent investor's composite growth rate expectations for price and dividends (see pp. 18-20, above).

In terms of the constant growth DCF model, I disagree with Mr. Brennan's findings as to investor expected growth rates and the appropriate dividend yield. Even the lower end (5.8%) of Mr. Brennan's growth rate range is excessive in comparison to expectations in the investment community and historical growth rates. Merrill Lynch's long-term growth forecast is only 5.6% and regulated utilities have not, in general, demonstrated an ability to consistently grow in excess of 5%. As shown in GSA Exhibit (PRW-8), AT & T recorded concurrent five-year dividend and price growth rates in Mr. Brennan's growth range, only once in the past 28 years. Moody's utilities historical growth has also been far less than Mr. Brennan's findings. GSA Exhibit (PRW-9) reveals just two five-year periods in which both dividend and price growth for these utilities fell within his growth rate range. In short Mr. Brennan's growth rate findings are well in excess of those supported by the facts in this case.

Similarly his dividend yield of 8.8% is biased upward. As shown previously in this testimony Bell Atlantic's current yield has averaged only 7.8% over the past 16 weeks.

Mr. Brennan's yield of 8.8% is out-dated and is not representative of current market conditions.

Q: WHAT OTHER ANALYSIS HAVE YOU PERFORMED TO REACH CONCLUSIONS ABOUT INVESTOR RETURN REQUIREMENTS ON COMMON EQUITY?

A: As a check on the reasonableness of my DCF findings I have calculated historical risk premiums between a portfolio of utility stocks and long-term Government bonds.

I have also considered recent indications from the investment community as to the current risk premium between stocks and bonds.

Q: ARE HISTORICAL RISK PREMIUMS USED BY THE INVESTMENT COMMUNITY TO MAKE INVESTMENT DECISIONS?

A: Historically available risk premiums are widely utilized by members of the investment community and are frequently included in required reading material for the training of financial analysts. The Ibbotson and Sinquefield findings have particularly widespread use and are frequently used by

portfolio managers in the development of scenarios of prospective returns available from stock investments.

Q: WHAT IS THE RATIONALE FOR USE OF HISTORICAL RISK PREMIUMS?

A: The rationale underlying use of historical risk premiums is that investors are risk-averse and that incentives in the form of higher expected returns are required to convince investors to purchase more risky securities. Historical data suggest that investors have generally been rewarded for assuming such risks. As Shown in GSA Exhibit (PRW-14), a portfolio of the S&P Index stocks offered the greatest total return since 1928 followed by a portfolio of utility stocks then corporate bonds. These long-term returns are consistent with general perceptions of the relative risks of these three groups of securities with the higher returns associated with the more risky securities.

By comparison of historical returns from investments of differing risks, risk premiums previously available to investors may be calculated. The statistical distribution of these premiums depicts past investor experience and is indicative of premiums likely to be available in the future. Premiums falling in the tails of the distribution are improbable and, in most cases, would not be representative of investor expectations. I believe, however, that average

historical premiums, for varying holding periods, and over an extended time frame, are a reasonable proxy for investor expected premiums over the long term.

Q: ARE HISTORICAL LONG-TERM RISK PREMIUMS AN ACCURATE INDICATION OF CURRENT INVESTOR REQUIREMENTS?

A: Long-term historical premiums may, or may not be representative of current investor requirements. An increase in the riskiness of bonds relative to stocks (such as that which occurred since late 1979) may, for example, reduce the risk premium between these two types of securities. Similarly, changes in the relative tax treatment of returns on bonds and stocks may change the historical risk/return relationship.

Q: WHAT HISTORICAL RISK PREMIUMS HAVE YOU FOUND BETWEEN UTILITY STOCKS AND BONDS?

A: I have found that, based on geometric mean returns, a portfolio of Moody's 24 Utilities during the period 1929 to 1983 returned approximately 170 basis points more than long-term Government bonds. To be consistent with my belief that the risk premium be based on available returns over varying holding periods and an extended time frame, I have computed the average of the premiums that would have been realized

over all whole-year holding periods of one year to ten years during 1929-1983. Only those holdings periods with end-of-calendar-year boundaries were considered. The average premium from this analysis was 348 basis points for utility stocks over Government bonds.

Q: WHAT DATA HAVE YOU USED TO CALCULATE THESE RISK PREMIUMS?

A: For Government bonds, I have used the bond data described by Ibbotson and Sinquefield in their publications of various titles, such as Stocks, Bonds, Bills, and Inflation: The Past (1926 - 1976) and the Future (1977 - 2000) and updates to these publications. For the utility stock data, I have relied on the monthly price and dividend data found in Moody's Public Utility Manual. These utilities include representative privately owned, electric and gas utility companies, that are dispersed geographically across the nation. Although the regulated telephone industry and Moody's utilities vary in risk, dependent on the risk measure used, the risk premiums available to investors in these regulated utilities should, in general, be similar. An indication of this similarity is the comparability of bond ratings of the Bell operating companies and Moody's Utilities.

All dividends are assumed to be reinvested at the closing price for the month in which they were received. The long-term historical period chosen for analysis was 1929 to 1983. Data prior to 1929 are not available from the Moody's Manual on the Moody's stock index.

Q: HAVE SIGNIFICANT CHANGES IN THE RISK PREMIUM BETWEEN UTILITY STOCKS AND BONDS OCCURRED RECENTLY?

A: Yes, significant changes have occurred. For example, the October 1979 policy change of the Federal Reserve and had a significant impact on interest rate volatility and, in turn, on required risk premiums. Although both stocks and bonds are interest rate sensitive, the greatest impact of this change has been felt in the bond market. Articles in the Wall Street Journal and Federal Reserve statistical papers have highlighted this impact. For example, an October 29, 1980, article in the Journal noted that "Bond buying these days has become a greater gamble than buying stocks. That once unthinkable notion is now widely accepted by investors ....." Also the investment firm of Goldman Sachs reported in an April 1981 research paper that the average equity risk premium over bonds was - .5% at that time.

A more recent publication from Merrill Lynch, "Valuation Perspectives", dated April, 1985 indicates that the reduced risk premiums between stocks and bonds recorded in 1979-1981 continue to prevail. This report also clearly shows that bond price volatility continues to exceed that of stocks in general.

Q: DO THE CONDITIONS THAT EXISTED DURING 1979 THROUGH 1983 CONTINUE TO AFFECT THE REQUIRED RISK PREMIUM BETWEEN UTILITY STOCKS AND BONDS?

A: Investors have not forgotten the extreme volatility and interest rate highs that occurred during this period. Although interest rates remained relatively stable during 1983, volatitlity has returned to the bond market in 1984 and early 1985 without a corresponding increase in stock price volatility.

The decline in volatility may be quantified by comparing the coefficients of variation (standard deviation divided by the mean) for stock and bond prices. Using Moody's monthly stock and bond data, coefficients of variation in 1983 were .027 and .014, respectively. Comparable values for the period January 1984 to September 1984 are .0428 and .0489 (stocks vs. bonds). During a more recent six month period (October '84 to March '85), coefficients of variation for

utility stocks and bonds were .0274 and .0290, respectively. These comparison reveal that stock and bond price were more volatile in 1984 and early 1985 than in 1983, and that utility bond prices were once again more volatile than stock prices. This recent relationship between stock and bond volatility measures supports selection of the lower end of the historical risk premium range.

Q: WHAT OTHER FACTOR HAS A PREDOMINANT INFLUENCE ON THE REQUIRED PREMIUM BETWEEN UTILITY STOCKS AND BONDS?

A: Another factor affecting premiums over the past several years is the favorable tax treatment of dividends paid to corporate and private investors. The impact of the income tax factor is readily apparent from comparison of yields at issuance of preferred stocks and long-term bonds. These comparisons are shown in GSA Exhibit (PRW-10).

Interest in the benefits from investment in utility firms has increased in recent years as evidenced by the start-up of some tax managed and utility funds. These funds invest primarily in utility firms and are of particular interest to corporate investors that may take advantage of the 85% dividend exclusion. The Fidelity Management and Research Company and Vanguard are examples of money management firms that have offerings in this area.

Q: BASED ON THE RESULTS FROM YOUR RISK PREMIUM STUDY, WHAT CONCLUSIONS HAVE YOU DRAWN CONCERNING THE REASONABLENESS OF YOUR DCF-DETERMINED INVESTOR RETURN REQUIREMENTS ON BELL ATLANTIC'S COMMON STOCK?

A: I believe that the 170 to 348 basis point premiums calculated for Moody's 24 Utilities over long-term Government bonds should be the starting point for determining the risk premiums for Bell Atlantic's stock. These premiums represent an average of long-term historical premiums for medium grade utilities.

The favorable tax treatment of dividends paid on common stocks and increased volatility in the bond market favors the lower end of the historical risk premium range. Since the average yield on long-term Treasury securities during a recent 16-week period (1/18/85 - 5/3/85) has been 11.6%, my DCF findings of 13.40% offers a risk premium of 180 basis points. This premium is within the range of premiums that have been available to investors in utility stocks over the long-term and should offer returns that are competitive with alternative investments of corresponding risks.

Q: WHY DO YOUR RISK PREMIUM RESULTS DIFFER FROM THOSE OF MR. BRENNAN?

A: Mr. Brennan's risk premium findings are fully dependent on his application of a DCF model (see pp. 37, 49 of his testimony). Although his DCF method for risk premium determination differs from his direct application of DCF techniques to Bell Atlantic's data, many of the previously identified biases remain. His growth rates are based on atypically high short-term earnings and dividend growth experience and short-term forecasts (5-year) without consideration of lower long-term expectations. He also ignores the requirement for use of a composite of dividend and price growth rates in the DCF model. Furthermore, his results are inconsistent with past investor experience that I have documented. His DCF based risk premium findings are basically a repeat of his direct DCF analysis and offer no new evidence as to Bell Atlantic's or Bell of Pennsylvania's cost of equity.

Q: HAVE YOU PERFORMED ANY OTHER CHECKS ON THE REASONABLENESS OF YOUR DCF FINDINGS?

A: Yes. The final check on reasonableness that I have performed is an analysis of the statistical relationship between current market-to-book ratios for telephone utility companies and the corresponding expected returns on book equity. As with my risk premium analysis, my market-to-book ratio analysis to totally independent of my DCF approach and therefore offers an acceptable method for checking the reasonableness of DCF findings. The return authorized in this case should be comparable to those generally required by a utility of similar risk to Bell of Pennsylvania to allow new equity sales with net proceeds, on average, equal to book value. My market-to-book analysis will provide an indication of the level of expected returns on equity that as of April 26, 1985, correspond to market-to-book ratios near 1.0.

Q: WHAT METHOD AND DATA WERE USED IN YOUR MARKET-TO-BOOK ANALYSIS?

A: For current market-to-book ratios and expected returns on equity (ROE), I relied on the April 26, 1985, Value Line Investment Survey. Data on 15 regulated telephone utilities were utilized in the analysis. Current market-to-book

ratios were estimated for each company by dividing the recent market price, shown in the Value Line report, by an estimated book value. The book values utilized were estimated from the end-of-year 1984 actuals and 1985 estimates from Value Line. Value Line's estimated ROEs for 1984, 1985 and the period 1987-1989 were chosen as unbiased estimates of expected returns on book equity.

A regression equation was then fitted to the data points with market-to-book ratio as the dependent variable and expected ROE, a measure of financial strength, and percent of net profits paid out as dividends as the independent variables. Other independent variables, such as the company's recent price volatility (the coefficient of variation) and safety ranking were also considered in the analysis. Various combinations of the independent variables were tried in an attempt to obtain the greatest explanatory power. The greatest explanatory power was offered by Value Line ROE estimates for the period 1985-1989, the financial strength measure, and the dividend payout measure. These variables explained approximately 85% of the variation in market-to-book values. A plot of the relationship between the current market-to-book ratios and ROE is shown in GSA Exhibit (PRW-11).

Q: WHAT CONCLUSIONS HAVE YOU DRAWN FROM THE MARKET-TO-BOOK ANALYSIS CONCERNING THE REASONABLENESS OF YOUR DCF FINDINGS?

A: Regression analysis results reveal that an ROE of 12.54% corresponds to a market-to-book ratio of 1.0. The figure falls below the lower end of my DCF range of 12.74% to 14.05%. Under the assumption that Value Line's expected ROEs are unbiased, my market-to-book analysis indicates that my DCF findings are more than sufficient to offer an opportunity to sell new stock at prices near book value and thereby support the reasonableness of these findings.

Q: YOUR FINDINGS ON BELL ATLANTIC'S RETURN REQUIREMENTS HAVE VARIED DEPENDING ON THE METHOD USED. WHAT IS YOUR POINT ESTIMATE OF BELL ATLANTIC'S EQUITY RATE?

A: My point estimate for Bell Atlantic's bare equity rate is 13.40% the mid-point of my DCF range. The DCF and risk premium analyses that I have performed rely on recently recorded stock prices and long-term Treasury security yields. Results are, therefore, indicative of investor return requirements during the period, 1/18/85 - 5/3/85, in which these prices and yields were recorded. My initial return on equity findings must therefore be adjusted to reflect return requirements prospectively applicable to the period during which rates from this case will likely be in

effect.

In terms of the economic cycle, the remainder of 1985 and 1986 is generally expected to be one of economic expansion. I, therefore, believe it instructive to review trends in the cost of capital following past recessionary periods for information on likely future trends. Such trends are shown graphically for the period 1956 to 1984 in GSA Exhibit (PRW-12). For four of the five recessionary periods shown interest rates have not only declined from the peak for the economic cycle, but lower levels of interest rates have remained for a number of years thereafter. The only exception to this pattern was the brief recession of 1980 that was triggered by artifical credit controls and "moral suasion" from the Federal Reserve and then affected by political consideration of the upcoming election.

These past patterns in interest rates and current consensus projections for relatively flat interest rate trends, provide support for the midpoint of my DCF range. My risk premium and market-to-book ratio analyses also indicate the midpoint of my DCF range is consistent with investors' historical experience and supportive of market-to-book ratios in excess of 1.0.

Volatility in the capital markets has, however, made even near-term interest rate forecasts susceptible to large errors. In light of such volatility and my market-to-book analysis, I consider the mid-point of my DCF range to be the best current estimate of the Company's bare bones cost of equity in this case. The Commission should, however, consider the outlook for cost of capital trends as they materialize and modify their findings accordingly at the time for decision in this case.

Q: SHOULD YOUR FINDINGS AS TO BELL OF PENNSYLVANIA'S COST OF EQUITY BE ADJUSTED FOR FLOTATION COSTS AND MARKET PRESSURE IN THIS CASE?

A: No. An adjustment of Bell of Pennsylvania's bare equity rate for flotation costs and market pressure offers an insurance policy to stockholders against unfavorable markets. Premiums in this policy are paid by the ratepayers, but the stockholders are the beneficiaries. Furthermore, this policy pays benefits in the form of higher returns on equity whether or not the affects of unfavorable markets during stock sales are experienced. Since Bell Atlantic anticipates no new stock sales in the foreseeable future, except through its dividend reinvestment plan, a flotation adjustment offrs clear immediate benefits to its stockholders, but no comparable benefits to the ratepayer.

Such an adjustment in this case in inequitable and should not be allowed.

Q: COMPANY WITNESS GIRARD AND BRENNAN RECOMMEND ON ADJUSTMENT TO THE COST OF EQUITY FOR THE EFFECTS OF FLOTATION COSTS EVEN IF NO NEW EQUITY SALES ARE PLANNED FOR THE FORESEEABLE FUTURE. CAN YOU PROVIDE AN EXAMPLE DEMONSTRATING THE INEQUITY OF SUCH AN ADJUSTMENT?

A: Yes. Using an example similar to that of Mr. Girard, I'll assume that a company has $100 of common equity outstanding and that the investor required return on this equity determined by DCF techniques is 10%. I further assume, as Mr. Girard has done, that the market-to-book ratio is 1.0 and that all the Company's earnings are paid out in dividends. If no new equity issuances are planned, company earnings of 10% on book equity clearly satisfy investor requirements, i.e., company earnings of $10 annually (10% x $100 book value) exactly equals investor requirements of $10 (10% x $100 market price).

Company earnings in excess of 10%, as requested by Mr. Girard and Mr. Brennan, would therefore exceed investor requirements on the company's existing equity and would be inequitable to ratepayers.

Q: WHAT CAPITAL STRUCTURE HAVE YOU FOUND REASONABLE FOR BELL OF PENNSYLVANIA?

A: The capital structure I recommend contains 44.0% long-term debt, 1.8% short-term debt, and 54.2% common equity. This structure contains slightly more debt and less equity than the structure contained in Company witness Girard's testimony.

Q: WHY HAVE YOU REJECTED THE CAPITAL STRUCTURE RECOMMENDED BY THE COMPANY?

A: I have rejected the Company proposed capital structure because it results in accounting ratios that are in excess of those necessary to maintain the Company's credit rating. For example, the Company's fixed charge coverage ratio calculated using its proposed capital structure and costs of capital is near 6 times as shown in GSA Exhibit (PRW-15). Based on the recently revised coverage requirements published by Standard and Poor's in its Credit Week dated February 25, 1985, 6 times is at the upper end of the acceptable range for a AA bond rating, and in fact, well within the 5.6 times lower limit specified by S & P for a AAA rating (note that S & P ranges for two different bond ratings may overlap).

Maintenance of accounting ratios near the S & P specified upper limit for a given credit rating requires higher rates for telephone services yet does not guarantee higher bond ratings or lower costs of debt or equity. Unless lower debt and equity costs, sufficient to offset the higher rates necessary to achieve the high accounting ratios, are forthcoming, the maintenance of high accounting ratios are unnecessary, and inequitable to the ratepayer.

Q: DOES THE CAPITAL STRUCTURE YOU RECOMMEND PROVIDE ACCOUNTING RATIOS SUFFICIENT TO MAINTAIN THE COMPANY'S CREDIT RATING?

A: Yes, it does. As shown in GSA Exhibit (PRW-15), Part II, the fixed charge coverage ratio associated with the capital structure I recommend is approximately 4.6 times. This ratio is within the range of 4.5 to 6.5 times S & P specifies for a AA rating and is therefore within reason, based on this primary test of earnings adequacy. The capital structure I propose is in fact, the revenue requirement minimizing capital structure given the component costs of capital and the assumption that short-term debt equals 1.8% of total capital.

Q: DOES THAT CONCLUDE YOUR TESTIMONY?

A: Yes.

Appendix A

Educational and Professional Summary

NAME: Philip R. Winter

EDUCATION:

University of Oklahoma, 1965
MA in Mathematics

BS, Southwest Missouri State College, 1964
Major: Mathematics

HONORS RECEIVED:

Cum Laude Graduate
Who's Who Among Students in American Universities & Colleges

EMPLOYMENT:

Operations Research Analyst
Rate Case Division
Office of Public Utilities
General Services Administration
Washington, DC
December, 1979 to present

Program Analysis Branch Chief
Division of Program Planning and Analysis
Department of Health , Education and Welfare
Washington, DC
February, 1979 to December 1979

Operations Research Analyst
Policy and Procedures Division
Public Buildings Service
General Services Administration
October, 1976 to February 1979

Industrial Engineer and Mathematician
Manpower and Cost Control and Research Department
U.S. Postal Service, Hq.
Washington, DC
June, 1968 to October, 1976

Publication: "Single-stage vs. Multi-stage Discounted Cash Flow Analysis for Cost of Equity Determination;" Electric Ratemaking, Vol. 1, No. 5, Oct/Nov. 1982. Co-authored with David E. Kelley

"The Discounted Cash-flow Estimate of the Dividend Growth Rate Revisited", (Comment on prior article), Public Utilities Fortnightly, Nov. 8, 1984, pp. 56, 57

PARTICIPATION IN REGULATORY PROCEEDINGS

Mr. Winter has testified on cost of capital issues before the following state commissions and other regulatory bodies: California, Colorado, District of Columbia, Federal Energy Regulatory Commission (FERC), Florida, Illinois, Maryland, Pennsylvania, and Texas.

BEFORE THE
PENNSYLVANIA PUBLIC SERVICE COMMISSION

In the Matter of the: Application of The Bell Telephone Company of Pennsylvania for authority to increase existing rates and charges for telephone service	)	Docket No. 2779

Documents of

PHILIP R. WINTER

General Services Administration
on behalf of the Federal Executive Agencies

General Services Administration (PUR)
18th & F Streets, N.W.
Washington, DC 20405
(202) 566-0277

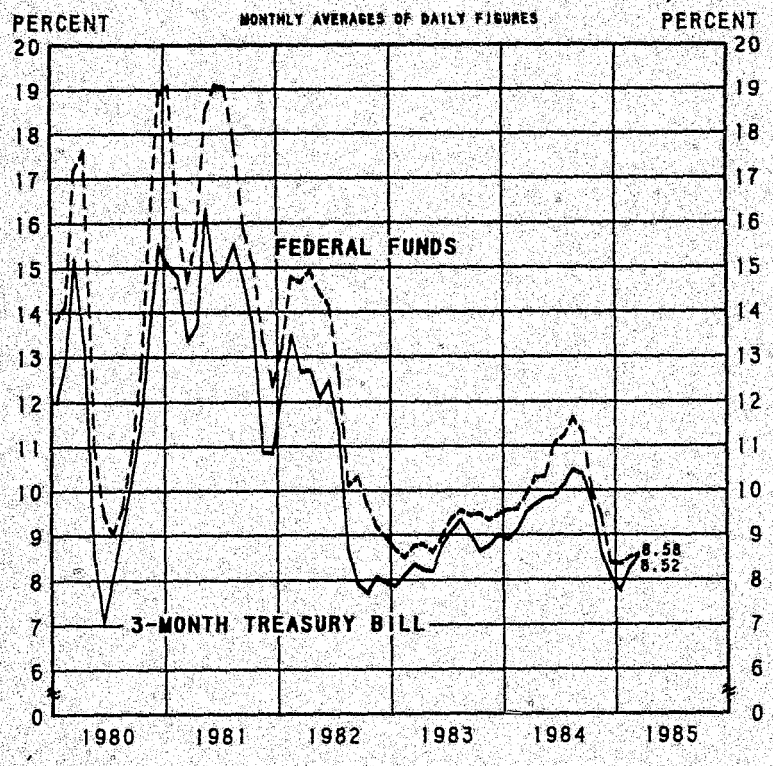
May 10, 1985

GSA EXHIBIT (PRW-1)

COMPUTATION OF BELL OF PENNSYLVANIA'S OVERALL COST OF CAPITAL

	% of Total Capital	Effective Cost (%)	Weighted Cost (%)
Long-term debt	44.0	8.62	3.79
Short-term debt	1.8	8.50	.15
Common Equity	54.2	13.40	7.26
Total	100.00%		11.20%

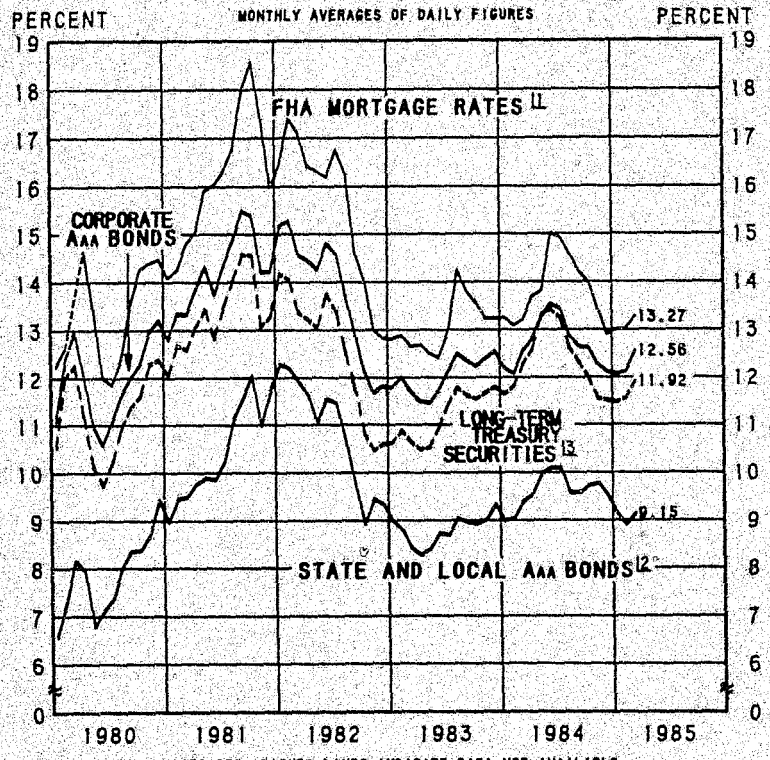
MONEY MARKET RATES



LATEST DATA PLOTTED: MARCH

PREPARED BY FEDERAL RESERVE BANK OF ST.LOUIS

LONG-TERM INTEREST RATES



11 FHA 30-YEAR MORTGAGES; DASHED LINES INDICATE DATA NOT AVAILABLE

12 MONTHLY AVERAGES OF THURSDAY FIGURES

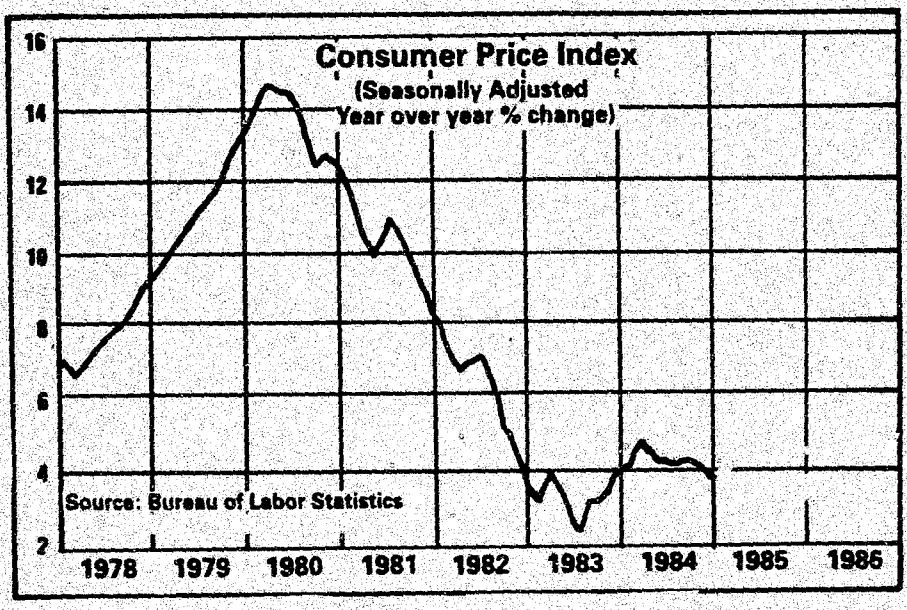
13 AVERAGE OF YIELDS ON COUPON ISSUES DUE OR CALLABLE IN TEN YEARS OR MORE, EXCLUDING ISSUES WITH FEDERAL ESTATE TAX PRIVILEGES; COMPUTED BY THIS BANK

LATEST DATA PLOTTED: MARCH

PREPARED BY FEDERAL RESERVE BANK OF ST.LOUIS

GSA Exhibit (PRW-3)

I. TRENDS IN CHANGES IN THE CONSUMER PRICE INDEX.

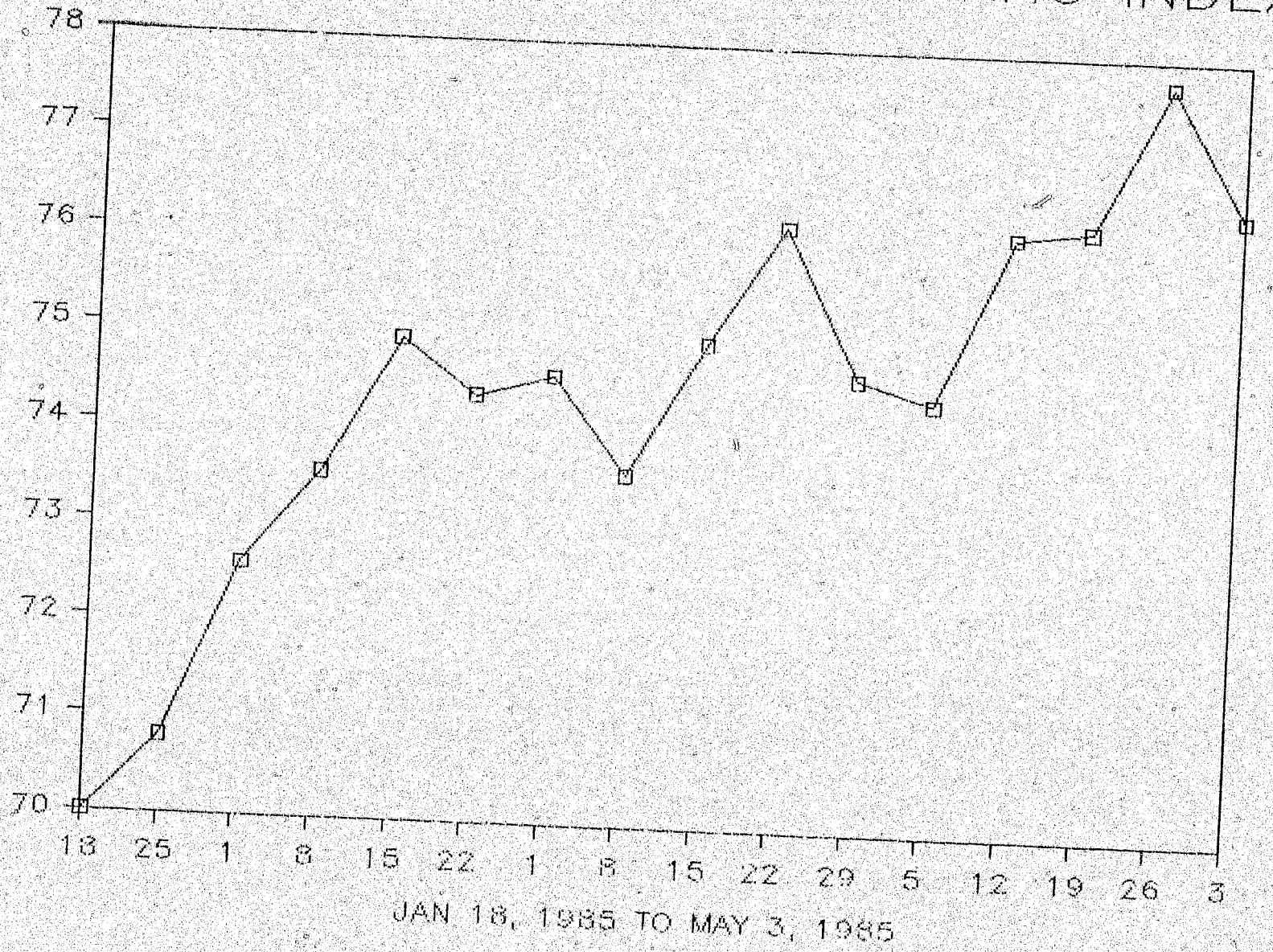


II. FORECASTS OF INFLATION IN CONSUMER PRICES (1985-1986).

	1985 over 1984(%)	1986 over 1985(%)
-L. Meyer & Associates	3.5	3.2
-Evans Economics	3.4	4.5
-Univ. of Michigan M.Q.E.M.	3.3	4.6
-Data Resources, Inc.	3.5	3.8
-University of California L.A.	3.5	3.6
-Chase Econometric	3.5	4.3
-Value Line	4.3	5.0
-Blue Chip Consensus	3.7	4.6
-Merrill Lynch	3.5	4.5
-Citicorp Information Services	4.4	6.0
-Dr. Walter W. Heller, U.of Minn	3.7	4.6
-Dr. Murray Weidenbaum, Wash. U., St. L.	3.5	4.4

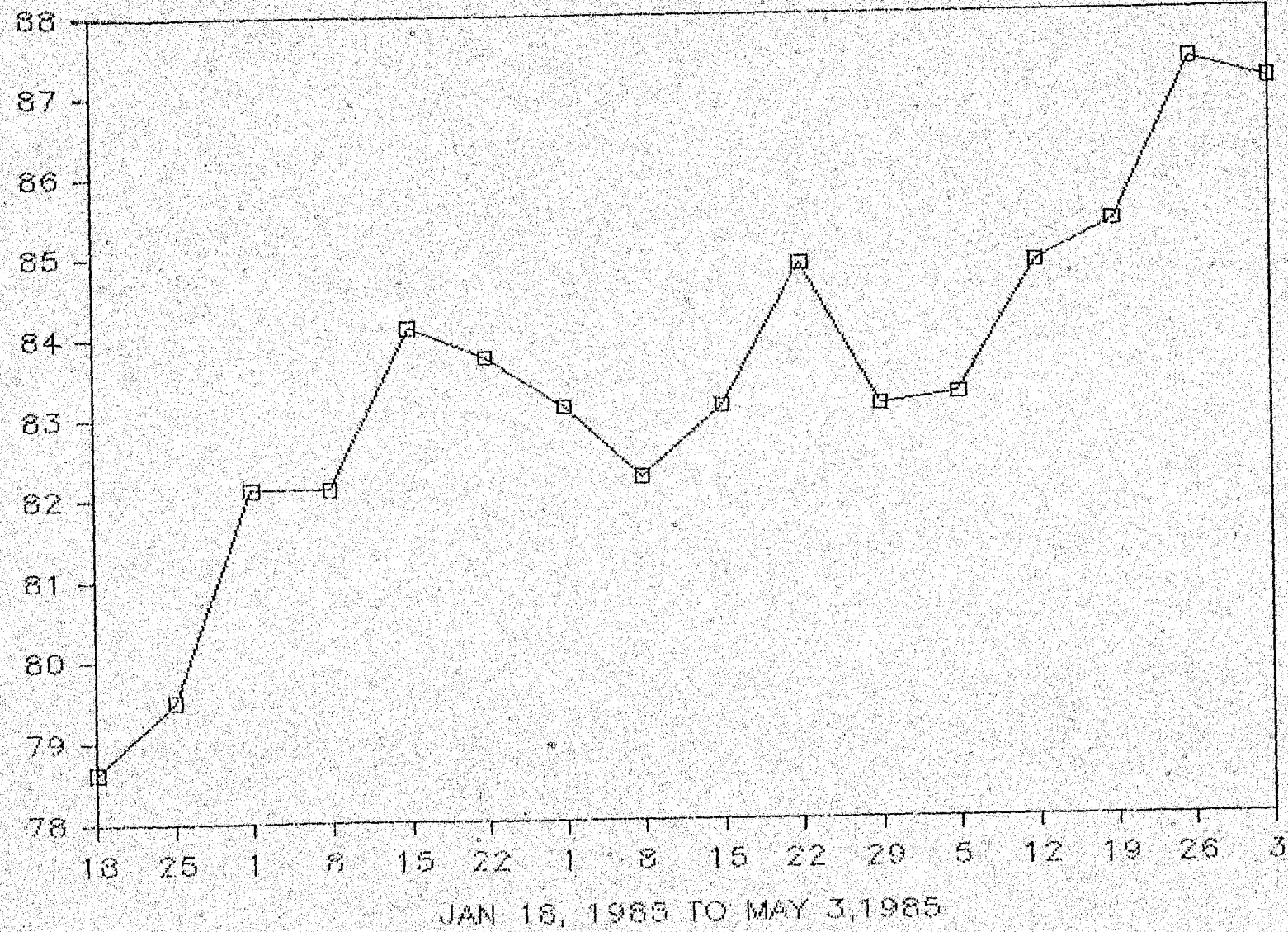
Source: Blue Chip Economic Indicators; April 10, 1985.
The Value Line Investment Survey, "Selection and Opinion", February 8, 1985

REGENT PRICE TREND FOR RHC INDEX



GSA Exhibit (PRM-4)

RECENT PRICE TREND FOR BELL ATLANTIC



GSA Exhibit (PRU-5)

GSA Exhibit (PRW-6)

Comparison of Net Profit Margins and
Return on Equity Trends for Bell Atlantic, the
Bell Regional Holding Companies, and Large Corporations
1981-1984

Part I:

	1981	1982	1983	1984
After Tax Profit Margin (%):				
Bell Atlantic				12.0
Bell RHC's				11.8
Large Corporations	4.9	4.1	4.5	4.9
Return on Equity (%):				
Bell Atlantic				13.0
Bell RHC's				13.1
Large Corporations	14.0	11.0	11.5	13.2

Source: Data on Bell Atlantic and the other Regional Holding Companies are from the Value Line Investment Survey, dated April 26, 1985. Data on large corporations are from Business Week, dated March 15, 1982; March 14, 1983; March 21, 1984; and March 22, 1985.

Part II:

Fundamental Factors Contributing to Telephone Utility Returns on Equity for 1984

	Tot. Cap. Turnover		Leverage		Pre-Tax Prof. Margin		1-Tax Rate		ROE
Bell Atlantic	.6602	x	1.6313	x	.2107	x	.571	=	.130
RHCs Average	.6488	x	1.7206	x	.2027	x	.583	=	.131
% Difference	+1.757		-5.190		+3.947		-2.058		

Source: All calculation are based on estimated data contained in The Value Line Investment Survey, "Ratings & Reports", April 26, 1985.

GSA Exhibit (PRW-7)

ALGEBRAIC RELATIONSHIP ASSUMED IN THE DCF MODEL

(1) Infinite Model: $P_o = D_1/(1+K_1)+D_2/(1+K_2)^2+ \ldots +D_n/(1+K_n)^n + \ldots$

Where: P_o is the current price of the security
D_i is the dividend received in year i, i = 1 to ∞
K_i is the investor discount rate in year i, i=1 to ∞

Under simplifying assumptions of constant dividend growth and investor discount rate, this method becomes:

(2) $$P_o = D_o(1+G)/(1+K)+D_o(1+G)^2/(1+K)^2+\ldots+D_o(1+G)^n/(1+K)^n+\ldots$$

Where: D_o is the current dividend
G is the assumed constant dividend growth rate
K is the assumed constant investor discount rate

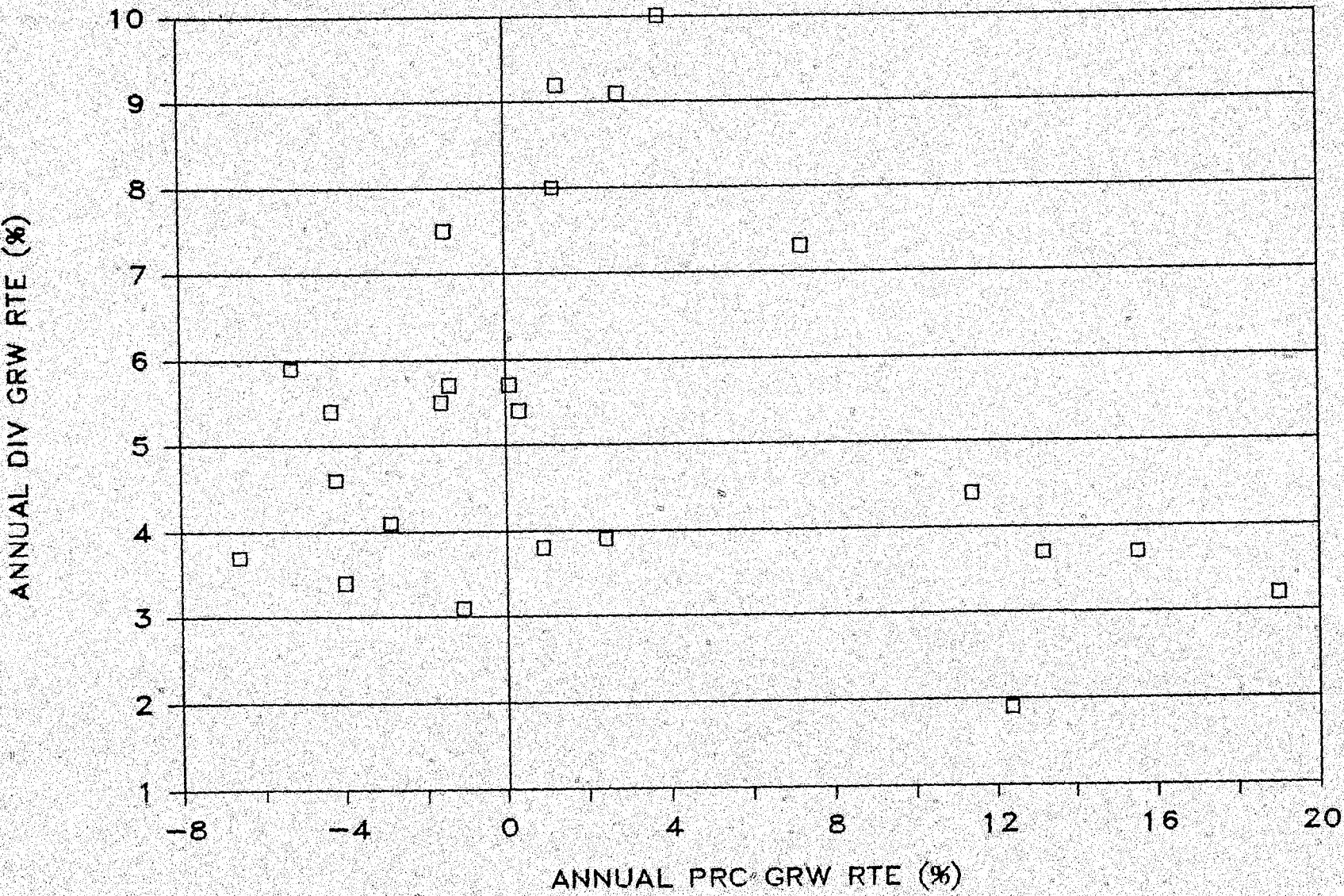
(3) Finite Model:

$$P_o = D_o(1+G)/(1+K)+D_o(1+G)^2/(1+K)^2+\ldots+D_o(1+G)^n/(1+K)^n+P_n/(1+K)^n$$

Where: P_n is expected stock price at end of a n-year finite period and constant dividend growth and investor discount rate are assumed.

A T & T PRC & DIV GRWTH HIST.

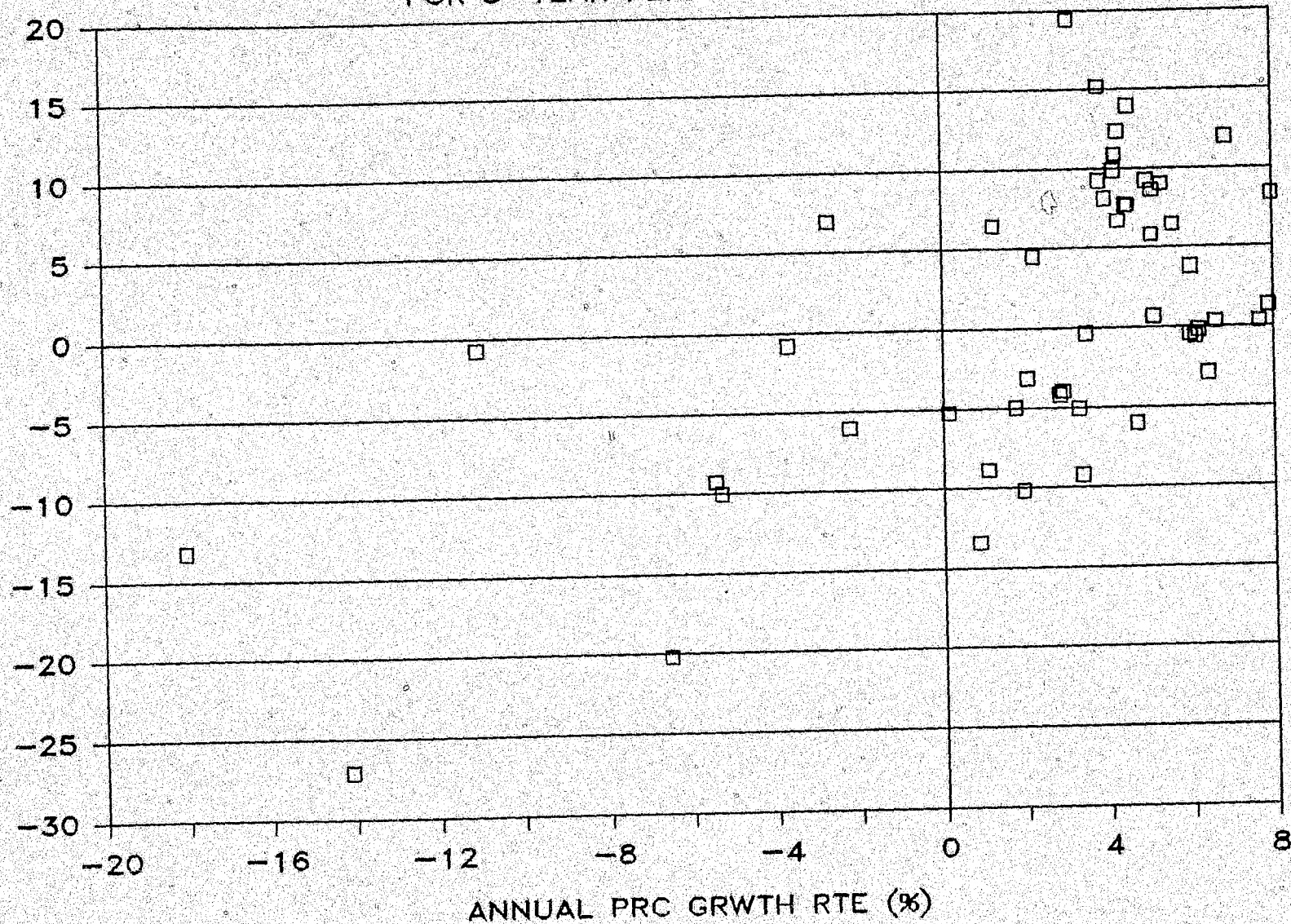
FOR 5-YEAR PERIODS 1955-1983



GSA Exhibit (PRW-8)

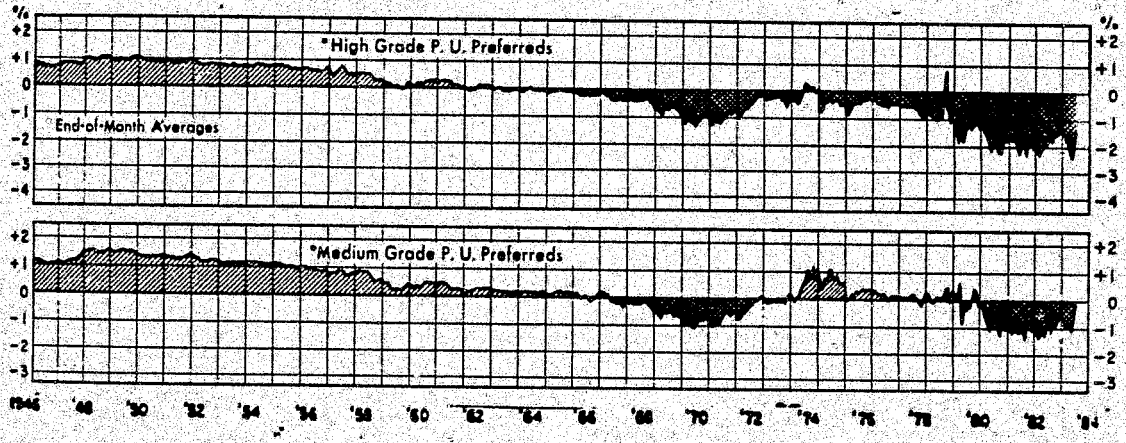
MOODY'S UTIL PRC & DIV GRWTH HIST.

FOR 5-YEAR PERIODS 1929-1983



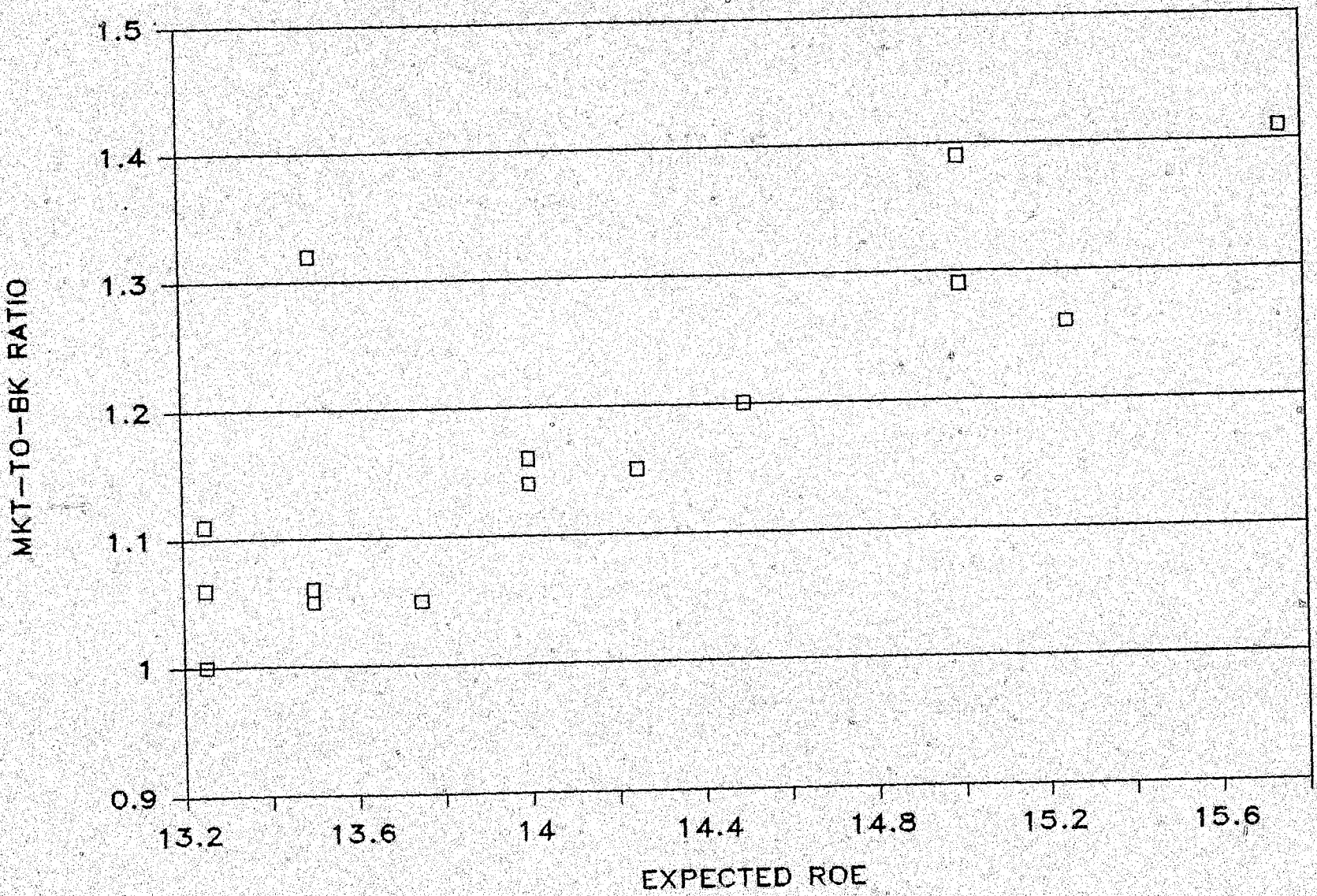
GSA Exhibit (PRW-9)

SPREADS OF PUBLIC UTILITY PREFERRED STOCKS FROM MOODY'S COMPOSITE PUBLIC UTILITY BOND AVERAGE



Souce: Moody's Public Utility Manual, 1984, p. a9.

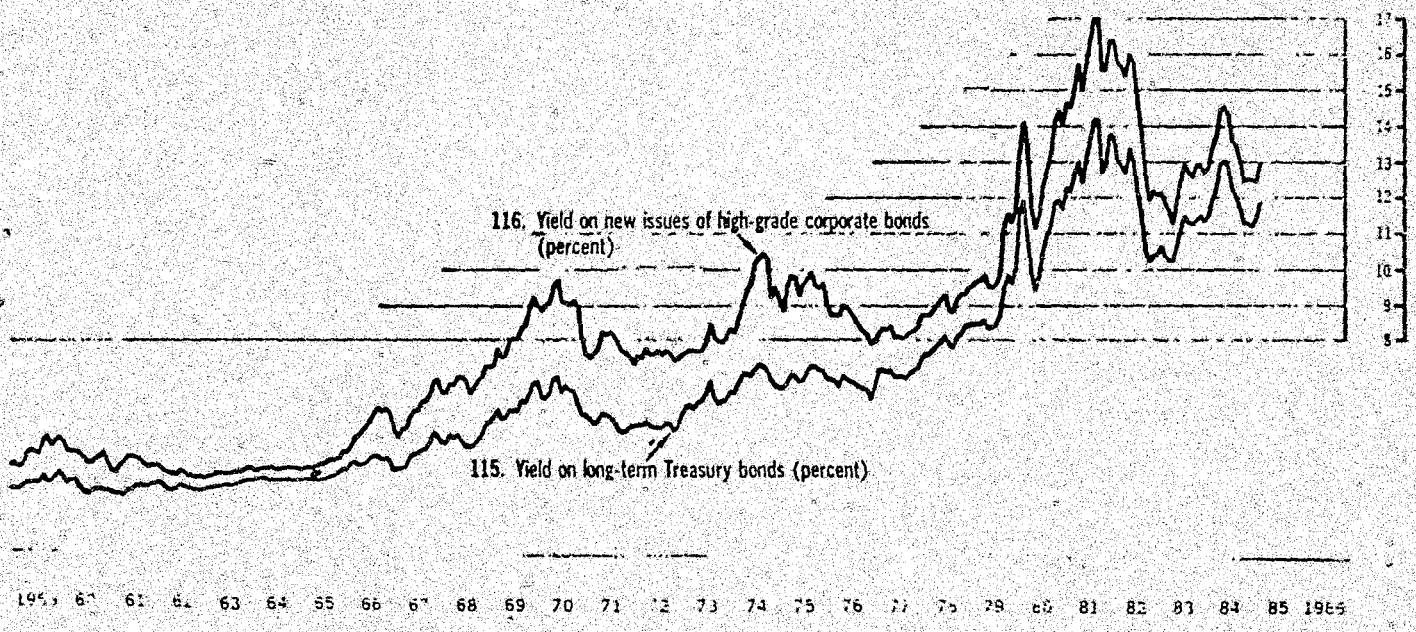
MKT-TO-BOOK RATIO ANALYSIS



GSA Exhibit (PRW-11)

COST OF CAPITAL TRENDS

1956 - 1984



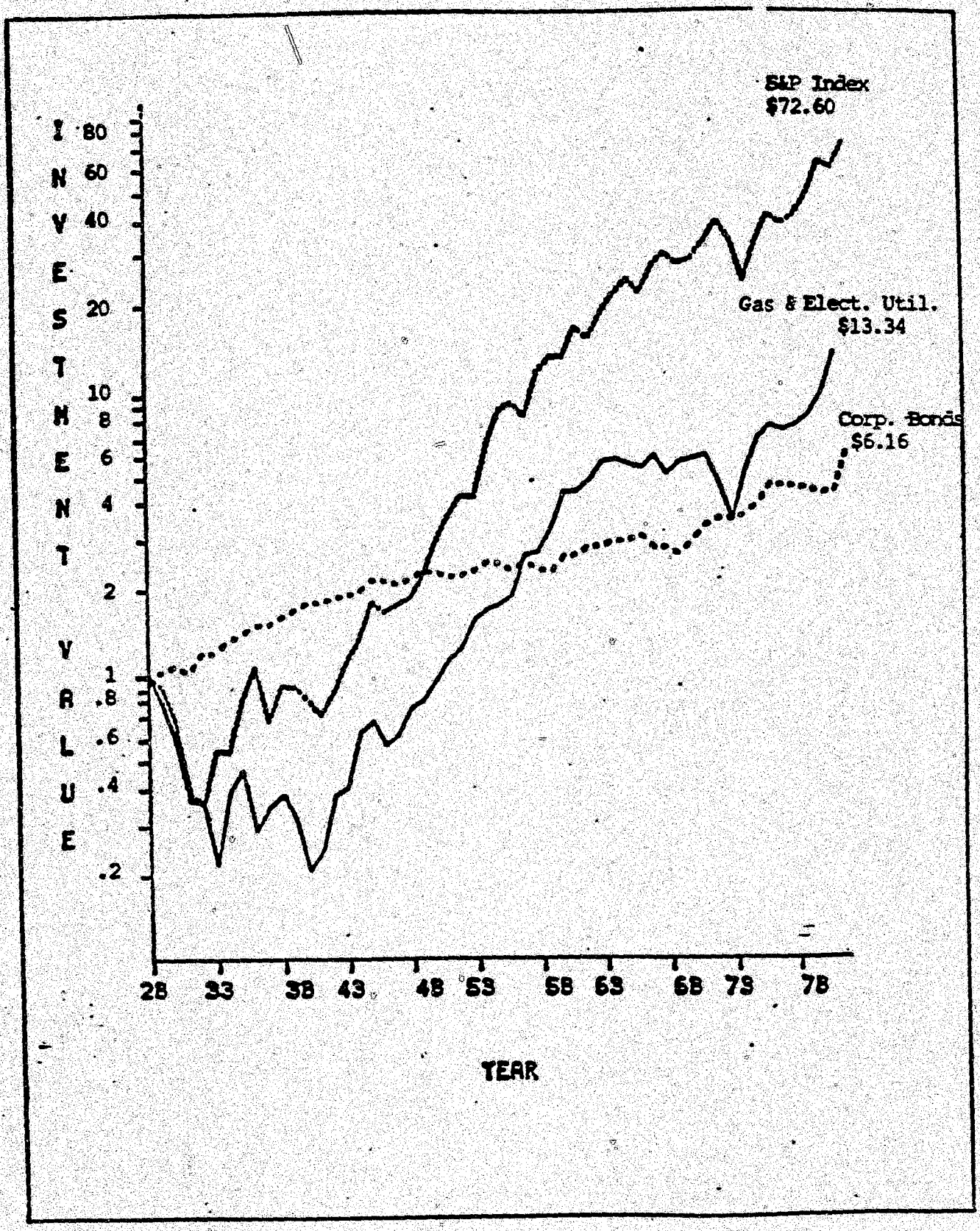
Source: Business Conditions Digest, March 1985, p. 34

GSA Exhibit (PRW-13)

MAJOR INVESTMENT FIRMS' RECENT SHORT-TERM GROWTH EXPECTIONS FOR BELL ATLANTIC DIVIDENDS AND EARNINGS

	Expected Average Annual Growth Rates (%)	
	Dividends	Earnings
Value Line	6.4	5.9
Prudential-Bache	5.0	7.0
Merrill Lynch	6.8	8.2
Salomon Brothers	6.0	6.5
Argus		6.6
Dean Witter	6.0	6.0
Average	6.0%	6.7%

Accumulated Wealth From a $1.00 Investment in
Corporate Bonds, Electric Utility Stocks, or the S&P Index



GSA EXHIBIT (PRW-15)

COVERAGE RATIOS ASSOCIATED WITH DIFFERENT CAPITAL STRUCTURES

I. Company proposed capital structure and costs of capital:

Company proposal: 57.14% equity; 41.07% long-term debt; 1.79% short-term debt; 8.62% cost of L.T. debt; 16.5% cost of equity; 10% cost of S.T. debt

$$\text{Coverage Ratio} = \frac{.0862(.4107)+.10(.0179)+.165(.5714)/.5}{.0862(.4107)+.10(.0179)}$$

$$= .2229/.0372 = 5.9$$

II. GSA proposed capital structure and costs of capital:

GSA proposal: 54.2% equity; 44.0% long-term debt; 1.8% short-term debt; 8.62% cost of L.T. debt; 13.4% cost of equity; 8.5% cost of S.T. debt

$$\text{Coverage Ratio} = \frac{.0862(.44)+.085(.018)+.134(.542)/.5}{.08\ 62(.44)+.085(.018)}$$

$$= .1825/.0395 = 4.6$$

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JAN 10 1986
SECRETARY'S OFFICE
Public Utility Commission

BEFORE THE CORPORATION COMMISSION OF THE
STATE OF OKLAHOMA

In the Matter of the Application of)
OKLAHOMA GAS AND ELECTRIC COMPANY, An)
Oklahoma Corporation, for an Increase) Cause No. 29450
in its Rates and Charges for Electric)
Service Within the State of Oklahoma)
and for Other Appropriate Relief)

Direct Testimony and Exhibits of

PHILIP R. WINTER
DAVID E. KELLEY

Witnesses on Behalf of Intervenor
GENERAL SERVICES ADMINISTRATION

GENERAL SERVICES ADMINISTRATION
LK - Room 4002
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July 12, 1985

DIRECT TESTIMONY OF
GSA WITNESS
PHILIP R. WINTER

BEFORE THE CORPORATION COMMISSION OF THE
STATE OF OKLAHOMA

In the Matter of the Application of OKLAHOMA GAS AND ELECTRIC COMPANY, An Oklahoma Corporation, for an Increase in its Rates and Charges for Electric Service Within the State of Oklahoma and for Other Appropriate Relief	))))))	Cause No. 29450

Direct Testimony of

PHILIP R. WINTER

On Behalf of Intervenor
GENERAL SERVICES ADMINISTRATION

DIRECT TESTIMONY OF PHILIP R. WINTER
FOR
GENERAL SERVICES ADMINISTRATION

Q: PLEASE STATE YOUR NAME AND YOUR BUSINESS ADDRESS.

A: My name is Philip R. Winter. My business address is Office of Public Utilities, Rate Case Division, General Services Administration, 18th and F Streets, N.W., Washington, DC 20405.

Q: WHAT IS YOUR POSITION WITH THE GENERAL SERVICES ADMINISTRATION?

A: I am an Operations Research Analyst in the Office of Public Utilities responsible for cost of capital and cost of service testimony in public utility rate cases. A statement of my educational background and professional experience is contained in Appendix A of this testimony.

Q: IN WHAT CAPACITY ARE YOU APPEARING BEFORE THIS COMMISSION?

A: I am appearing as a witness on behalf of the General Services Administration, representing the consumer interests of all Federal Executive Agencies including the Department of Defense.

Q: WHAT IS THE PURPOSE OF YOUR TESTIMONY HEREIN?

A: I address cost of capital issues, including Oklahoma Gas and Electric Company's (OG&E or Company) cost of debt, cost of preferred and common equity, and appropriate capital structure.

Q: WHAT OVERALL COST OF CAPITAL IS APPLICABLE TO THE COMPANY IN THIS CASE?

A: The Company's overall cost of capital applicable in this case is 10.15%. The capital structure utilized in calculation of this overall cost along with my recommendations on the cost of long-term debt, preferred stock, and common equity components of the structure are shown in GSA Exhibit (PRW-1).

Q: WHAT COST HAVE YOU DETERMINED APPLICABLE TO THE LONG-TERM DEBT COMPONENT OF THE COMPANY'S CAPITAL STRUCTURE?

A: The embedded cost of long-term debt is 8.48%. The 8.48% figure is based on data through December 31, 1984 as provided by Company witness Ryan in Section F of his prefiled testimony.

Q: WHAT COST IS APPLICABLE TO THE PREFERRED STOCK OF THE COMPANY'S CAPITAL STRUCTURE?

A: The embedded cost of the Company's preferred stock is 7.51%. Data from which this figure is calculated are also contained in Section F of Mr. Ryan's testimony.

Q: WHAT CONCLUSION HAVE YOU REACHED CONCERNING THE COST OF THE COMPANY'S COMMON EQUITY?

A: The current cost of the Company's common equity, is between 12.1% and 12.9%. In today's capital market, I consider the midpoint of this range, 12.5%, a reasonable point estimate of the cost of equity. Documentation of my analysis of the Company's cost of equity is contained in the following pages.

Q: WHAT CRITERIA HAVE YOU UTILIZED TO DETERMINE THE CURRENT INVESTOR REQUIRED RETURN FOR THE COMPANY?

A: I have applied the criteria established by the Supreme Court in the Bluefield and Hope decisions. In Bluefield Waterworks & Improvement Co. v. Public Service Commission of West Virginia, 262 U.S. 679, 693 (1923), the Court stated:

"The return should be reasonably sufficient to assure confidence in the financial soundness of the utility and should be adequate, under efficient and economical management, to maintain and support its credit and enable it to raise the money necessary for the proper discharge of its public duties."

In addition, as an indication of an upper bound on the return and the potential instability of investor return requirements, the Court stated (262 U.S. at 692-693):

"...[the company] has no constitutional right to profits such as are realized or anticipated in highly profitable enterprises or speculative ventures."

"A rate of return may be reasonable at one time and become too high or too low by changes affecting opportunities for investment, the money market and business conditions generally."

The Hope decision (FPC v. Hope Natural Gas Co., 320 U.S. 591, 603 (1944)) provided guidelines similar to those that I initially related from the Bluefield opinion, as follows:

"...the return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital."

Q: DO THE CRITERIA STATED IN THESE SUPREME COURT DECISIONS INDICATE UPPER AND LOWER BOUNDS FOR THE COST OF EQUITY?

A: In a general sense, they do. The lower bound is established as the return sufficient to maintain the Company's credit in the marketplace. Indications of the sufficiency of the return are the Company's success in raising necessary capital and the similarity of the after tax return to that after tax return on other investments of corresponding risks. Certainly investors' capital will be attracted by those firms of corresponding risk that offer the higher after tax returns. Unless the return offered by the regulated utility is competitive, the capital attraction criterion is unlikely to be met.

The upper bound on returns is stated to be below that realized or anticipated from highly profitable enterprises or speculative ventures. For high-grade utility firms, without consideration of the company's specific risk level, I believe yields-to-maturity on bonds rated below BBB by Standard & Poor's or Baa by Moody's, may be used as an indicator of this upper bound. Such bonds are considered to be "predominantly speculative" or have "speculative elements" according to these rating services and offer returns in excess of that generally required in the marketplace.

Q: GIVEN THE GENERAL SUPREME COURT GUIDELINES, HOW HAVE YOU DETERMINED SPECIFIC BOUNDARIES FOR THE COST OF THE COMPANY'S EQUITY?

A: I have first reviewed macroeconomic conditions that define the environment for today's credit market. Included in this review were expectations for, and recent trends in, the inflation rate, current Federal Reserve policy on monetary growth, and loan demand at large commercial banks. These interrelated factors are primary determinants of the cost of money. Secondly, I have performed a current market analysis of utility stocks, in general, and of the Company's common

stock to determine the Company's current cost of equity. Finally, I have reviewed cost of capital trends to draw conclusions about the prospective cost of the Company's equity for the period during which rates from this case will be in effect.

Q: WHY DO YOU BEGIN YOUR ANALYSIS OF THE COMPANY'S COST OF EQUITY WITH A REVIEW OF CURRENT MACROECONOMIC CONDITIONS?

A: As indicated above, macroeconomic conditions including the supply and demand for funds in the U.S. economy and the rate of inflation are primary determinants of the general rates of interest (costs) on borrowed or invested capital. These general costs establish the base from which a specific company's cost of capital is determined.

Q: HOW ARE THE FEDERAL RESERVE'S MONETARY POLICY, THE INFLATION RATE, LOAN DEMAND, AND THE COST OF MONEY RELATED?

A: The interrelationships of these factors are multifaceted and complex. In basic terms, however, a tight monetary policy with stable loan demand tends to decrease the rate of inflation and place upward pressure on interest rates in the

short-term. Over the long-term, interest rates would be expected to decline as inflationary pressures cool. Similarly, a policy toward increasing monetary growth with stable loan demand has tended to reduce interest rates over the short-term (due to the more plentiful supply of money), but exert upward pressure on the inflation rate. Over the long-term, interest rates would be expected to rise with the increasing rate of inflation. Short-term effects of monetary growth on interest rates may be lessened or increased by fluctuating loan demand and changes in velocity, i.e., the average number of times per year that a dollar is used to purchase components of GNP.

For example, heavy demand for business loans during the first quarter of 1985 (loan growth at a 9% annual compound rate) placed upward pressure on interest rates even with relatively rapid growth in the money supply (9% growth in M1). Relatively flat or declining demand for business loans subsequent to March, 1985, coupled with continued rapid growth in the money supply has more recently contributed to interest rate declines.

Q: WHAT HAS BEEN THE RECENT MONETARY POLICY OF THE FEDERAL RESERVE?

A: Recently stated goals of the Federal Reserve are "to foster monetary and financial conditions that will help to reduce inflation further, promote growth in output on a sustainable basis, and contribute to an improved pattern of international transactions" (see Record of Policy Actions of the Federal Open Market Committee, Meeting of February 12-13, 1985). To achieve these goals, the Federal Reserve has allowed monetary growth somewhat above its 1985 target growth range of 4% to 7% (for M1).

Primary concerns of the Federal Reserve's policy committee include the large Federal deficit, the strength of the dollar and its effect on American exports, and the potential for renewed inflation. The first two concerns (the deficit and strength of the dollar) may be alleviated over the short-term by more rapid monetary growth, i.e., higher monetary growth would likely reduce interest rates thereby easing the pressures of Federal borrowing and reducing the attractiveness of the dollar. Higher monetary growth may, however, reignite inflation. In an attempt to walk the fine line between a policy that is noninflationary and simultaneously sufficient to stimulate exports (lessen the dollar's value overseas) and finance the deficit, the Federal Reserve appears to be allowing monetary growth near or above the upper end of its target range while keeping a watchful eye on inflation trends. Unless the inflation rate

begins to rise, higher monetary growth will likely be tolerated.

Q: WHAT HAS BEEN THE IMPACT OF LOAN DEMAND, RECENT FEDERAL RESERVE POLICY, AND OTHER SIGNIFICANT FACTORS ON THE CREDIT MARKETS?

A: Recent interest rates on bonds and other fixed yield investments are shown in GSA Exhibit (PRW-2). Average yields on fixed income securities trended downward from the summer of 1984 through January 1985. Fixed income security yields dropped 150 to 350 basis points during this period. The Federal Reserve's restraint on monetary growth and increased loan demand in early 1985 subsequently led to a plateau in yield trends followed by increases of 50 to 100 basis points. Subsequent to mid-March, 1985, interest rates in general have dropped significantly. Declines of 150 to 200 basis points have led to the lowest yields experienced since the late 1970's. Contributing to the general declining trend in fixed income yields has been heavy foreign investment in U.S. securities, adequate money supply relative to demand, moderate levels of unemployment, and noninflationary levels of U.S. capacity utilization.

Q: HAVE INFLATION RATES ALSO BEEN IMPACTED BY FEDERAL RESERVE POLICY?

A: Yes, they have. The consumer price index (CPI) dropped an amazing 12 percentage points (15% to 3%) between its peak in 1980 and a relative low in 1983 (see GSA Exhibit (PRW-3), Part I). Since the 1983 low, inflation rates have risen to a level between 4% to 4.5%. Inflation rates recorded during the first five months of 1985 have averaged near the upper end of this range on an annualized basis.

Although other independent factors such as declining oil prices and the strength of the dollar against foreign currencies have contributed to favorable inflation rate trends, Federal Reserve action has been given a major portion of the credit for bringing inflation under control.

Q: WHAT IS THE CURRENT OUTLOOK FOR INFLATION?

A: Expectations for future inflation are commonly believed to be based on historical rates with the more recently experienced rates of increase carrying the greatest weight. The pattern of inflation has stabilized since early 1984, and current low levels of inflation are generally expected in the coming months. According to the June 10, 1985 issue of Blue Chip Economic Indicators, the consensus forecast by top economists for price inflation during 1985 is 3.7%. Similar forecasts for 1986 indicate expectations for consumer prices to rise at a 4.4% annual rate. Recent

inflation forecasts by major forecasting firms are shown in GSA Exhibit (PRW-3), Part II. Inflation rate expectations of these forecasters range between 3.2% and 5.2% for the period 1985-86.

The Blue Chip forecast for 1985 inflation is further supported by the Federal Reserve's Open Market Committee and survey results published in Business Week's, 1985 "Scoreboard Special". This latter source indicates an average 1985 inflation forecast from twenty-seven economists of 4.0% and twelve econometric services of 3.9%.

Q: WITHIN THE SCENARIO DESCRIBED ABOVE OF M1 GROWTH NEAR THE UPPER END OF THE FEDERAL RESERVE TARGET RANGE OF 4% TO 7% AND A PLATEAU IN INFLATION RATE TRENDS, WHAT IS THE OUTLOOK FOR THE COST OF CAPITAL?

A: If inflation continues to fall near 4% and credit demands are consistent with allowed monetary growth without oil, or other, price shocks, interest rates should decline. Alternatively, more restrictive monetary growth coupled with strong demands for credit will exert upward pressure on current rates. As reflected in the July 1, 1985 issue of Blue Chip Financial Forecasts, the consensus opinion is for little change in capital costs with seasoned Aa utility bond rates ranging between 11.7% and 11.9% during 1985 and

remaining in that range during the first three quarters of 1986.

Q: WITHIN THE CURRENT ENVIRONMENT CHARACTERIZED BY INFLATION EXPECTATIONS OF 3% to 5% AND A MODERATE FEDERAL RESERVE MONETARY POLICY, WHAT HAS BEEN THE PERFORMANCE OF ELECTRIC UTILITY STOCKS IN GENERAL?

A: Utility stock price trends, as indicated by the Dow Jones and Standard and Poor's utility indices, are shown graphically in GSA Exhibit (PRW-4) for the period March 22, 1985 to July 5, 1985. Both indices reflect significant upward price movements. On average, these indices have increased approximately 11% during the 16-week period. The recent strong market for these stocks has been attributed to continuing low levels of inflation, declining interest rates, and strong earnings growth.

Q: HAS THE COMPANY'S PERFORMANCE BEEN SIMILAR TO THAT OF OTHER ELECTRICS?

A: GSA Exhibit (PRW-5) shows OG&E's stock price trend to be similar to that of the indices. Price appreciation for the stock since the beginning of the 16-week period has been 11.5%, somewhat above that of the indices.

OG&E's price performance also compares favorably to book value. As of July, 1985, its price exceeded book value by approximately 34% (based on Value Line's book value projection for end-of-year 1985 and actual 1984 end-of-year book value).

Q: OF WHAT IMPORTANCE IS OG&E'S RECENT STOCK PRICE TREND TO YOUR DETERMINATION OF THE COMPANY'S RETURN REQUIREMENTS?

A: Stock prices carry information concerning investor return expectations and requirements. Prices recorded for OG&E'S stock represent the consensus opinion of the marketplace as to the stock's value given the current and prospective growth expectations and discount rates.

Theoretically, a stock's value is equal to the present value of expected future returns from investing in the stock. The future returns are in the form of dividends and price appreciation. From a knowledge of investors' expectations for dividend growth and price appreciation, investor return requirements may be estimated. By adjusting investor return requirements for the effects of flotation cost and market pressure (if any), OG&E's return requirements on equity may be estimated.

Q: IN GENERAL, WHAT IS THE RELATIONSHIP BETWEEN A COMPANY'S STOCK PRICE TREND AND INVESTOR RETURN REQUIREMENTS?

A: In general, increasing stock price trends in the short-term are a result of an increase in expected returns from the stock or a decline in investor return requirements. Similarly, decreasing stock price trends imply decreasing expected returns or rising required returns. This generalization assumes that investors' growth expectations do not change in the period of consideration.

Q: OG&E'S STOCK PRICE PERFORMANCE SHOULD BE SUPPORTED BY THE COMPANY'S UNDERLYING FUNDAMENTALS. WHAT IS THE RECENT TREND IN THESE FUNDAMENTALS AND HOW DO THEY COMPARE WITH MOODY'S ELECTRICS AND WITH LARGE CORPORATIONS IN GENERAL?

A: A review of fundamental ratios indicative of OG&E's recent performance (see GSA Exhibit (PRW-6)), reveals the following. OG&E's after-tax profit margins increased steadily between 1981 and 1983 before declining 9.2% between 1983 and 1984. Factors contributing to this decline include

pressures associated with Muskogee Unit 6, termination of a contract to sell firm power, and a return to more normal summer weather. OG&E's margins consistently fell below the average for Moody's Electrics during this four year period while returns on equity exceeded the average in two of the four years.

Although the Company's return on equity for 1984 (13.2%) is below the Moody's Electric average, this lower rate of return is predominantly due to OG&E having less leverage (total capital divided by total equity) and a lower after-tax flow-through rate (1-tax rate) than the average Electric. A lower 1984 profit margin also contributed to the lower OG&E return on equity (see GSA Exhibit (PRW-6) Part II). The decline in OG&E's return on equity between 1983 and 1984 is shown to be attributable to declining leverage, profit margin, and after-tax flow through.

GSA Exhibit (PRW-6) also contains comparative performance data for the large corporations covered by Business Week for the period 1981 through 1984. While OG&E's margin for 1981 through 1983 trended upward, relatively unaffected by the recession, the margins recorded for large corporations suffered during this period, dropping approximately 16%. OG&E's returns on equity exceeded average returns recorded

by large corporations during 1981-83, before falling even with the average for corporations in 1984. Given the lower overall risks associated with OG&E's equity, the returns on equity recorded by OG&E compare favorably with returns earned by large corporations during the four year period 1981-84.

Q: WHAT METHODS HAVE YOU USED TO DETERMINE THE COST OF EQUITY TO OG&E?

A: To estimate return requirements, I rely most heavily on the discounted cash flow (DCF) approach, an approach that utilizes a company's stock price along with expectations for dividend growth and price appreciation, to estimate investor return requirements. I also utilize a risk premium approach and a market-to-book ratio analysis to check the reasonableness of results from the DCF method.

Q: WHAT ASSUMPTIONS OR JUDGMENTS MUST THE ANALYST MAKE WHEN APPLYING THE DCF METHOD?

A: Primary assumptions in application of the DCF method are that the price paid for a security is an "equilibrium" price and is equal to the discounted stream of investor-"expected" dividends and price appreciation over the investor-holding period. The discount rate that equates a company's stock price to these expected returns is an indication of the investor-"required" rate of return. Algebraically, these assumptions may be expressed as shown in GSA Exhibit (PRW-7).

Q: WHAT JUDGMENTS MUST THE ANALYST MAKE BEFORE APPLYING THE DCF MODEL?

A: To apply the DCF model, the rate of return analyst must make decisions about the following items:

1. What is the investor-expected growth in dividends during the investment horizon and does the expected growth rate change over time?

2. What stock price is representative of current investor return requirements, e.g., the price of the stock on a specific date; the average price over the most recent

12 weeks, 16 weeks, or other period?

3. What is the investor's expected holding period or investment horizon, i.e., the future period over which the investor makes assumptions about potential returns?

4. What is the expected change in the stock's price during the investment horizon?

Q: WHAT FORM OR VERSION OF THE DCF MODEL HAVE YOU USED IN THIS CASE?

A: I rely on a "two-stage" model that allows explicit consideration of varying dividend growth rates over time.

Q: DOESN'T THE COMMONLY USED "YIELD PLUS GROWTH," i.e. D/P + g FORM OF THE DCF MODEL ALLOW CONSIDERATION OF GROWTH RATES THAT VARY OVER TIME?

A: No, it does not. The "yield plus growth" form of the DCF model is obtained from the longer version shown in GSA Exhibit (PRW-7) only if the assumption is made that dividends grow each year at a constant rate. In fact, if the D/P + g version is properly used, the analyst will concentrate on determination of an expected <u>long-term</u> growth rate as opposed to relying solely on near-term estimates.

Strictly speaking, the growth rate used in this simple form of the model is assumed to continue through infinity without change.

Q: WHAT OTHER ASSUMPTIONS ARE IMPLICIT IN THE CONSTANT GROWTH MODEL?

A: The constant growth DCF model also implicitly assumes that the market price, earnings and book value of the company's common stock each grow at the same constant rate as dividends. This assumption is a characteristic of the constant growth model even though a cursory review of individual utility companies' short- or long-term performance will show that these constant growth conditions are seldom experienced. If inaccuracies associated with the unrealistic constant growth assumption are to be minimized, the growth rate used must reflect the composite long-term growth expectations for all these elements i.e., price, dividends, earnings, and book value. Failure to consider composite growth rate expectations, especially for determination of long-term growth prospects, may lead to significant errors in DCF findings.

Q: WHY IS THE TWO-STAGE MODEL THAT CONSIDERS DIFFERING RATES OF GROWTH MORE APPROPRIATE THAN THE SINGLE-STAGE, OR CONSTANT GROWTH MODEL, IN ESTIMATING RETURN REQUIREMENTS?

A: The rate of utility company dividend and price growth has varied widely over past time periods. Although changes occur, from time to time, in the structure of the utility industry, I am aware of no such changes that have altered the prospective pattern of dividends and price growth. The investment community does, in fact, expect some variation in price and dividend growth over future holding periods. Given these expectations, a multi-stage DCF model that allows explicit consideration of varying growth rates is more appropriate for use in estimating investor return requirements.

Q: WHAT HAVE BEEN THE PAST PATTERNS OF DIVIDEND AND PRICE GROWTH FOR OG&E AND OTHER REGULATED UTILITIES?

A: Dividend and price growth patterns of OG&E and Moody's Electrics provide insight into the variability that may occur. OG&E's 5-year holding period growth patterns are shown for 1962 through 1984 in GSA Exhibit (PRW-8).

The OG&E data show dividend growth rates varying between approximately 2.7% and 9.3% dependent on the holding period. Price growth rates have varied even more widely, with annual compound rates of growth ranging between -10.7% and +11.4%. Of equal significance from a DCF analyst's point of view, is the fact that price and dividend growth differ markedly over the same holding period. This fact is apparent from the graph in PRW-8 by noting that the plotted points don't, as a rule, lie along a 45° diagonal through the origin. As emphasized earlier, the DCF model growth rate(s) must be representative of expectations for both price and dividends. Concentration by the analyst on one of these inputs to the DCF model without consideration of the other, may lead to sizable errors in results.

Similar data for Moody's Electric utilities in GSA Exhibit (PRW-9) offer additional evidence of the likely variability in dividend and price growth rates over time and in dividend and price growth for the same holding period. This evidence again supports the appropriateness of a multistage DCF model and the need to consider expectations for the composite of dividend and price growth.

Q: WHY DO PAST PATTERNS IN PRICE AND DIVIDEND GROWTH AFFECT CURRENT INVESTOR EXPECTATIONS?

A: Investors learn from past experience and are aware of the historical swings in dividend and price growth rates. They will therefore temper their future expectations with this knowledge. Whereas over the near term, investors may expect continuation of relatively high rates of dividend growth, such growth is unlikely to continue over extended periods. This fact is fully supported by historical data. Similarly, investors do not expect unreasonably low growth rates to continue uninterrupted.

Q: IS THE TWO-STAGE, OR MULTISTAGE, DCF MODEL ACCEPTED IN THE INVESTMENT AND ACADEMIC COMMUNITIES?

A: Yes, it is. Kidder, Peabody; Prudential-Bache; Salomon Brothers; Drexel, Burnham and Lambert; Goldman, Sachs & Co.; and others currently use multistage DCF models to estimate investor return expectations on common stock. Also academicians, such as David Hawkins of Harvard University, Eugene Brigham of the University of Florida, and Fred Weston of the University of California (Los Angeles), recognize the need for multistage models in texts they have authored.

Q: WHAT ARE THE BOUNDARIES OF THE TWO GROWTH PERIODS YOU EMPLOY IN THE DCF MODEL AND WHAT IS THE LOGIC FOR YOUR SELECTION OF THESE BOUNDARIES?

A: I recommend a DCF model of the following form:

$$P = \sum_{i=1}^{4} D(1+g_1)^i/(1+k)^i + \sum_{i=5}^{\infty} (1+g_1)^4(1+g_2)^{i-4}/(1+k)^i$$

where "P" and "D" are the current price and dividend, respectively, "g_1" is the average annual growth rate expected within the next four years, "g_2" the average annual growth expected over the long term, and "k" is the investor-required return.

The near-term boundary defines a four-year forecast period. Forecasts covering a period of this length are frequently published by investment services and are generally available to investors. Value Line, Dean Witter, Merrill Lynch, and Salomon Brothers are among the better known firms providing forecasts for this period.

Because of the broad circulation of such forecasts and the relative accuracy with which four-year forecasts may be made, I believe this period receives particular attention by investors. Forecasts and expectations beyond the three to five year period become less certain and may vary widely. Using the above rationale, I have selected a four-year period for the initial stage of the DCF model.

Q: ON WHAT DATA HAVE YOU RELIED TO ESTIMATE GROWTH RATES APPROPRIATE FOR USE IN THIS MODEL?

A: I rely on investment firm growth forecasts for OG&E for both the near- and long-term. In addition, I have reviewed long-term growth histories for both regulated and unregulated firms.

Q: WHAT ARE INVESTMENT FIRM FORECASTS FOR OG&E GROWTH DURING THE FIRST STAGE OF THIS MODEL?

A: Relying on the most recent reports available from various investment firms, I have found the following. Value Lines's forecasts, dated April 26, 1985, indicate expectations for annual dividend, earnings, and book value growth from the beginning of 1985 to the end of 1988 to average 5.2%, 7.1%, and 4.5%, respectively. Prudential-Bache in its April, 1985 Quantum report, expects 5-year dividend and earnings growth

of 5%. Merrill Lynch in its May-June 1985, Quantitative Analysis report projects five-year growth rates for dividends and earnings to be 4.0% and 5.0%, respectively. Salomon Brothers' June 5, 1985, Electric Utility Monthly indicates expectations for a 6.0% rate of growth during the next five years. ARGUS, in its May 13, 1985 Electric Utility Rankings publication, expects 4.5% annual growth for OG&E between 1985 and 1990. Duff and Phelps' March 1, 1985 Common Stock Summary reports expectations for average earnings growth near 4%. Finally, Dean Witter's most recent 5-year growth forecast for OG&E is 3.5%. Near-term dividend growth rates estimated by these investment firms range between 3.5% and 6.0% and are summarized in GSA Exhibit (PRW-13).

Q: WHAT ARE YOUR FINDINGS FROM REVIEW OF SHORT-TERM HISTORICAL GROWTH RATES FOR OG&E?

A: Historical, 5-year holding period, price and dividend growth rates are shown in GSA Exhibit (PRW-8). For the ten most recent 5-year holding periods with end of calendar year boundaries, e.g., Dec. 31, 1979 to Dec. 31, 1984; Dec. 31, 1978 to Dec 31, 1983, dividend growth rates have ranged between 2.71% and 3.83%. Price growth rates during these same ten, 5-year holding periods have not kept pace with

dividend growth, and price declines have frequently been recorded.

Q: WHAT IS YOUR CONCLUSION CONCERNING OG&E's NEAR-TERM GROWTH RATE?

A: Based on review of forecasts from investment services and the historical short-term growth history, expectations for short-term dividend growth vary widely between 2.71% and 6.0%. For purposes of DCF analysis in this case, I consider short-term growth rates of 3.3% to 4.70% to be representative of most investors' expectations for OG&E. The 4.7% figure is the average of the investment firm dividend growth forecasts shown in GSA Exhibit (PRW-13). The 3.3% lower end of the range is supported by the average of recently recorded actual short-term growth rates for OG&E's dividend. I employ this range of growth rates in the two-stage DCF model, along with long-term growth expectations, to estimate current investor return requirements.

Q: WHAT ARE INVESTORS' EXPECTATIONS FOR GROWTH DURING THE SECOND STAGE OF THIS MODEL?

A: Beyond the four-year period, it is unreasonable to believe that either unusually high, or unusually low, current growth

is expected by investors over the long term. I therefore rely on investment firm forecasts of long-term growth potential and on actual long-term growth rates for regulated utilities and unregulated firms. The electric utility industry as represented by Moody's Utility Index, experienced annual growth rates in dividends and price over the long-term of approximately 3.0%. As for unregulated firms, the DOW Industrial Index has recorded long-term dividend and price growth rates of approximately 3.7% and 4.2%, respectively.

As for long-term growth forecasts from investment firms for OG&E, Merrill Lynch is the only firm that regularly makes such forecasts available. Its previously referenced May-June, 1985 report indicates long-term, steady-state, growth expectations of 4.0%.

The long-term growth histories and the investment firm forecast range between 3% and 4.2%. Relying on the long-term growth histories for indices of regulated and unregulated firms, I consider 3.6% the mid-point of the historical range to represent the lower end of the long-term growth rate appropriate for use in my two-stage model. Both unregulated firms and regulated electric utilities have demonstrated an ability to maintain long-term price and

dividend growth at this rate. I consider 4.0% reasonable for the upper end of my long-term growth rate range since it is consistent with the investment firm forecast and representative of more recent growth within the industry. Although the 4.0% rate exceeds the long-term experience of regulated utilities, it is near current expectations for long-term price inflation and is therefore within reason.

Q: WHAT IS THE CURRENT DIVIDEND YIELD TERM OF YOUR DCF EQUATION AND HOW WAS IT DERIVED?

A: The current dividend yield (D_o/P_o) is 8.3%. This yield is computed as the average of the quotients of end-of-week stock prices and effective annual dividend rates from the most recent 16-week period (3/22/85-7/5/85). A period of this duration is necessary to level the effects of temporary price fluctuations. Also the 16-week period, as opposed to a shorter period, is less likely to be fully contained within a peak or valley in the price pattern.

If significant trends in price movement are observed during the period, information conveyed by these trends should be incorporated in the final decision concerning the cost of

equity. OG&E's stock price varied from $22.75 to $26.25 during this period, based on end-of-week prices, and the indicated annual dividend was $2.00 per share.

Q: WHAT ARE YOUR CONCLUSIONS FROM THE TWO-STAGE DCF MODEL CONCERNING INVESTOR RETURN REQUIREMENTS ON OG&E's STOCK?

A: A current dividend yield of 8.3% coupled with near- and long-term expected growth rates of 3.3% to 4.7% and 3.6% to 4.0%, respectively, indicate investor requirements of between 12.1% and 12.9%. In terms of the "yield plus growth" or "constant growth" model, my analysis indicates investors expect constant annual dividend and price growth rates between 3.5% and 4.2%, i.e., $12.12 = (1.035)\ 8.3 + 3.5$ $12.9 = (1.042)\ 8.3 + 4.2$.

Q: WHAT ARE THE POINTS OF DISAGREEMENT BETWEEN YOUR DCF RESULTS FOR OG&E's AND THOSE OF DR. OLSON?

A: Dr. Olson's DCF finding of a 15.0% to 15.5% cost of equity for OG&E (Olson Testimony, p. 24) is based on an average dividend yield of 9.5% and average growth rates ranging between 5.5% and 6.0%. His DCF yield findings differ from mine because he relies on OG&E stock price data that reflect investor expectations and return requirements in the summer

and fall of 1984 (Olson Testimony, p. 19). GSA Exhibit (PRW-2) depicts the significant decline in costs of capital that have occurred subsequent to July, 1984, and OG&E'S stock price has correspondingly increased reflecting this trend. This stock price increase has led to significant declines in OG&E's dividend yield. If Dr. Olson would rely on yield data indicative of current investor requirements, his DCF findings would be reduced approximately 110 basis points.

As for Dr. Olson's growth rate findings, even the lower end (5.5%) of his range is excessive in comparison to expectations in the investment community and historical growth rates. Merrill Lynch's long-term growth forecast for OG&E is only 4.0% and all but one of the six near-term, investment firm dividend growth rate forecasts shown in GSA Exhibit (PRW-13) fall below Dr. Olson's range. As shown in GSA Exhibit (PRW-8), OG&E has never recorded during the past 22-years, short-term (five-year), concurrent dividend and price growth rates in Dr. Olson's growth range. Moody's utilities historical growth has also been far less than Dr. Olson's findings. GSA Exhibit (PRW-9) reveals just four five-year periods in the past 55-years in which both dividend and price growth for these utilities fell within his growth rate range. In short, Dr. Olson's growth rate findings are well in excess of those indicated by the facts in this case.

Q: WHAT OTHER ANALYSIS HAVE YOU PERFORMED TO REACH CONCLUSIONS ABOUT INVESTOR RETURN REQUIREMENTS ON COMMON EQUITY?

A: As a check on the reasonableness of my DCF findings I have calculated historical risk premiums between a portfolio of utility stocks and long-term Government bonds.

I have also considered recent indications from the investment community as to the current risk premium between stocks and bonds.

Q: ARE HISTORICAL RISK PREMIUMS USED BY THE INVESTMENT COMMUNITY TO MAKE INVESTMENT DECISIONS?

A: Historical risk premiums are widely utilized by members of the investment community and are frequently included in required reading material for the training of financial analysts. The Ibbotson and Sinquefield findings have particularly widespread use and are frequently used by portfolio managers in the development of scenarios of prospective returns available from stock investments.

Q: WHAT IS THE RATIONALE FOR USE OF HISTORICAL RISK PREMIUMS?

A: The rationale underlying use of historical risk premiums is that investors are risk-averse and that incentives in the form of higher expected returns are required to convince investors to purchase more risky securities. Historical data suggest that investors have generally been rewarded for assuming such risks. As shown in GSA Exhibit (PRW-14), a portfolio of the S&P Index stocks offered the greatest total return since 1928, followed by a portfolio of utility stocks, then government bonds. These long-term returns are consistent with general perceptions of the relative risks of these three groups of securities with the higher returns associated with the more risky securities.

By comparison of historical returns from investments of differing risks, risk premiums previously available to investors may be calculated. The statistical distribution of these premiums depicts past investor experience and is indicative of premiums likely to be available in the future. Premiums falling in the tails of the distribution are improbable and, in most cases, would not be representative of investor expectations. I believe, however, that average

historical premiums, for varying holding periods, and over an extended time frame, are a reasonable proxy for investor expected premiums over the long term.

Q: ARE HISTORICAL LONG-TERM RISK PREMIUMS AN ACCURATE INDICATION OF CURRENT INVESTOR REQUIREMENTS?

A: Long-term historical premiums may, or may not be representative of current investor requirements. An increase in the riskiness of bonds relative to stocks (such as that which occurred since late 1979) may, for example, reduce the risk premium between these two types of securities. Similarly, changes in the relative tax treatment of returns on bonds and stocks may change the historical risk/return relationship.

Q: WHAT HISTORICAL RISK PREMIUMS HAVE YOU FOUND BETWEEN UTILITY STOCKS AND BONDS?

A: I have found that, based on geometric mean returns, a portfolio of Moody's 24 Utilities during the period 1929 to 1984 returned approximately 182 basis points more than long-term Government bonds. To be consistent with my belief that the risk premium be based on available returns over varying holding periods and an extended time frame, I have computed the average of the premiums that would have been realized

over all whole-year holding periods of one year to ten years during 1929-1984. Only those holdings periods with end-of-calendar-year boundaries were considered. The average premium from this analysis was 359 basis points for utility stocks over Government bonds.

Q: WHAT DATA HAVE YOU USED TO CALCULATE THESE RISK PREMIUMS?

A: For Government bonds, I have used the bond data described by Ibbotson and Sinquefield in their publications of various titles, such as Stocks, Bonds, Bills, and Inflation: The Past (1926 - 1976) and the Future (1977 - 2000) and updates to these publications including Stocks, Bonds, Bills, and Inflation - 1985 Yearbook. For the utility stock data, I have relied on the monthly price and dividend data found in Moody's Public Utility Manual. These utilities include representative privately owned, electric and gas utility companies, that are dispersed geographically across the nation.

All dividends are assumed to be reinvested at the closing price for the month in which they were received. The long-term historical period chosen for analysis was 1929 to 1983. Data prior to 1929 are not available from the Moody's Manual on the Moody's stock index.

Q: HAVE SIGNIFICANT CHANGES IN THE RISK PREMIUM BETWEEN UTILITY STOCKS AND BONDS OCCURRED RECENTLY?

A: Yes, significant changes have occurred. For example, the October 1979 policy change of the Federal Reserve had a significant impact on interest rate volatility and, in turn, on required risk premiums. Although both stocks and bonds are interest rate sensitive, the greatest impact of this change has been felt in the bond market. Articles in the Wall Street Journal and Federal Reserve statistical papers have highlighted this impact. For example, an October 29, 1980, article in the Journal noted that "Bond buying these days has become a greater gamble than buying stocks. That once unthinkable notion is now widely accepted by investors ....." Also the investment firm of Goldman Sachs reported in an April 1981 research paper that the average equity risk premium over bonds was - .5% at that time.

A more recent publication from Merrill Lynch, "Valuation Perspectives", dated April, 1985 indicates that the reduced risk premiums between stocks and bonds recorded in 1979-1981 continue to prevail. This report also clearly shows that bond price volatility continues to exceed that of stocks in general.

Q: DO THE CONDITIONS THAT EXISTED DURING 1979 THROUGH 1983 CONTINUE TO AFFECT THE REQUIRED RISK PREMIUM BETWEEN UTILITY STOCKS AND BONDS?

A: Investors have not forgotten the extreme volatility and interest rate highs that occurred during this period. Although interest rates remained relatively stable during 1983, volatility has returned to the bond market in 1984 and early 1985 without a corresponding increase in stock price volatility.

The decline in volatility may be quantified by comparing the coefficients of variation (standard deviation divided by the mean) for stock and bond prices. Using Moody's monthly stock and bond data, coefficients of variation in 1983 were .027 and .014, respectively. Comparable values for the period January 1984 to September 1984 are .0428 and .0489 (stocks vs. bonds). During a more recent six month period (October '84 to March '85), coefficients of variation for

utility stocks and bonds were .0274 and .0290, respectively. These comparisons reveal that stock and bond prices were more volatile in 1984 and early 1985 than in 1983, and that utility bond prices were once again more volatile than stock prices. This recent relationship between stock and bond volatility measures supports selection of the lower end of the historical risk premium range.

Q: WHAT OTHER FACTOR HAS A PREDOMINANT INFLUENCE ON THE REQUIRED PREMIUM BETWEEN UTILITY STOCKS AND BONDS?

A: Another factor affecting premiums over the past several years is the favorable tax treatment of dividends paid to corporate and private investors. The impact of the income tax factor is readily apparent from comparison of yields at issuance of preferred stocks and long-term bonds. These comparisons are shown in GSA Exhibit (PRW-10).

Interest in the benefits from investment in utility firms has increased in recent years as evidenced by the start-up of some tax managed and utility funds. These funds invest primarily in utility firms and are of particular interest to corporate investors that may take advantage of the 85% dividend exclusion. The Fidelity Management and Research Company and Vanguard are examples of money management firms that have offerings in this area.

Q: BASED ON THE RESULTS FROM YOUR RISK PREMIUM STUDY, WHAT CONCLUSIONS HAVE YOU DRAWN CONCERNING THE REASONABLENESS OF YOUR DCF-DETERMINED INVESTOR RETURN REQUIREMENTS ON OG&E'S COMMON STOCK?

A: I believe that the 182 to 359 basis point premiums calculated for Moody's 24 Utilities over long-term Government bonds should be the starting point for determining the risk premiums for OG&E'S stock. These premiums represent an average of long-term historical premiums for medium grade utilities.

The favorable tax treatment of dividends paid on common stocks and increased volatility in the bond market favors the lower end of the historical risk premium range. Since the average yield on long-term Treasury securities during a recent 16-week period (3/22/85 - 7/5/85) has been 11.1%, my DCF findings of 12.1% to 12.9% offer risk premiums of 100 to 180 basis points. These premiums fall below the average premiums that have been available to investors in utility stocks over the long-term. My DCF findings also indicate a risk premium between OG&E's common equity and medium-term first mortgage bonds of 160 to 440 basis points. This finding is based on recently recorded yields-to-maturity on OG&E bonds that mature in 3 to 12 years. Since late May, 1985 these OG&E bonds have yielded 8.5% to 10.5%, with the

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more recent yields nearer the lower end of this range. Since OG&E's common equity is, in a sense, a variable rate issue with allowed returns adjusted every few years to market-based levels, the medium-term OG&E bonds are the appropriate point of comparison. This comparison indicates a yield spread, or risk premium, that is fully sufficient to reward investors for investing in OG&E's equity.

Q: WHY DO YOUR RISK PREMIUM RESULTS DIFFER FROM THOSE OF DR. OLSON?

A: Dr. Olson's risk premium findings are fully dependent on his application of a DCF model (see pp. 27, 28 of his testimony) or on survey results from large institutional investors that were documented in early 1984 (Olson Testimony, p. 26). Although his DCF method for risk premium determination differs from his direct application of DCF techniques to OG&E data, i.e., his growth rates for risk premiums are based on 10-year historical dividend growth rates, many of the previously identified biases remain. His growth rates ignore forecasted growth rates from the investment community, and he simply assumes that investors expect the growth rates experienced during the prior ten years to reoccur indefinitely into the future (see his testimony, p. 27). Since investors' expectations are known to be dependent on a multitude of factors in addition to past

growth, his DCF based risk premium findings are based on incomplete analyses. He also ignores the requirement for use of a composite of expected dividend and price growth rates in the DCF model. Furthermore, his results ignore and are inconsistent with actual past investor experience that I have documented.

As for his risk premium findings that are based on the survey of large institutional investors, they are based on investor requirements of over 1-year ago. Furthermore, Dr. Olson has provided no evidence that the institutional investors surveyed have pre-tax or after-tax return requirements similar to the typical investor in OG&E. In fact, Dr. Olson has stated in response to GSA data request No. 1, questions 9-11, that he does <u>not</u> believe the return objectives of these institutions are the same as the typical investor in OG&E and that he does <u>not</u> know the marginal income tax bracket of these institutions. The difference between the return requirements of the surveyed institutions and the typical investor in OG&E is the apparent reason for the difference between Dr. Olson's survey based, risk premium findings and the risk premium findings I have documented.

Q: HAVE YOU PERFORMED ANY OTHER CHECKS ON THE REASONABLENESS OF YOUR DCF FINDINGS?

A: Yes. The final check on reasonableness that I have performed is an analysis of the statistical relationship between current market-to-book ratios for electric utility companies and the corresponding expected returns on book equity. As with my risk premium analysis, my market-to-book ratio analysis is totally independent of my DCF approach and therefore offers an acceptable method for checking the reasonableness of DCF findings. The return authorized in this case should be comparable to those generally required by a utility of similar risk to OG&E to allow new equity sales with net proceeds, on average, equal to book value. My market-to-book analysis will provide an indication of the level of expected returns on equity that as of April 26, 1985, correspond to market-to-book ratios near 1.0. The April 26 date is the most recent date the required data was readily available.

Q: WHAT METHOD AND DATA WERE USED IN YOUR MARKET-TO-BOOK ANALYSIS?

A: For current market-to-book ratios and expected returns on equity (ROE), I relied on the April 26, 1985, Value Line Investment Survey. Data on 46 regulated electric utilities were utilized in the analysis. Current market-to-book ratios were estimated for each company by dividing the recent market price, shown in the Value Line report, by an estimated book value. The book values utilized were estimated from the end-of-year 1984 actuals and 1985 estimates from Value Line. Value Line's estimated ROEs for 1984, 1985 and the period 1987-1989 were chosen as unbiased estimates of expected returns on book equity.

A regression equation was then fitted to the data points with market-to-book ratio as the dependent variable and expected ROE, a measure of financial strength, and percent of net profits paid out as dividends as the independent variables. Other independent variables, such as the company's relatively return volatility (the beta coefficient) and safety ranking were also considered in the analysis. Various combinations of the independent variables were tried in an attempt to obtain the greatest explanatory power. The greatest explanatory power was offered by Value Line ROE estimates

for the period 1985-1989, the financial strength measure, and the dividend payout measure. These variables explained approximately 95% of the variation in market-to-book values. A plot of the relationship between the current market-to-book ratios and ROE is shown in GSA Exhibit (PRW-11).

Q: WHAT CONCLUSIONS HAVE YOU DRAWN FROM THE MARKET-TO-BOOK ANALYSIS CONCERNING THE REASONABLENESS OF YOUR DCF FINDINGS?

A: Regression analysis results reveal that an ROE of 11.38% corresponds to a market-to-book ratio of 1.0. The figure falls below the lower end of my DCF range of 12.1% to 12.9%.

Under the assumption that Value Line's expected ROEs are unbiased, my market-to-book analysis indicates that my DCF findings are more than sufficient to offer an opportunity to sell new stock at prices near book value. This market-based analysis also shows that Dr. Olson's recommend return on equity of 16.75% corresponds to a market-to-book ratio of 1.5, a ratio that is well in excess of that necessary to provide protection against stock sales at prices below book value.

Q: YOUR FINDINGS ON OG&E's RETURN REQUIREMENTS HAVE VARIED DEPENDING ON THE METHOD USED. WHAT IS YOUR POINT ESTIMATE OF OG&E's EQUITY RATE?

A: My point estimate for OG&E's bare equity rate is 12.5% the mid-point of my DCF range. The DCF and risk premium analyses that I have performed rely on recently recorded stock prices and long-term Treasury security yields. Results are, therefore, indicative of investor return requirements during the period, 3/22/85 - 7/5/85, in which these prices and yields were recorded. My initial return on equity findings must therefore be adjusted to reflect return requirements prospectively applicable to the period during which rates from this case will likely be in effect.

In terms of the economic cycle, the remainder of 1985 and 1986 is generally expected to be one of economic expansion. I, therefore, believe it instructive to review trends in the cost of capital following past recessionary periods for information on likely future trends. Such trends are shown graphically for the period 1959 to 1984 in GSA Exhibit (PRW-12). For four of the five recessionary periods shown interest rates have not only declined from the peak for the economic cycle, but lower levels of interest rates have remained for a number of years thereafter. The only exception to this pattern was the brief recession of 1980

that was triggered by artifical credit controls and "moral suasion" from the Federal Reserve and then affected by the upcoming election.

These past patterns in interest rates and current consensus projections for relatively flat interest rate trends, provide support for the midpoint of my DCF range. My risk premium findings support the upper end of my DCF range, i.e., 12.9% while my market-to-book ratio analysis offers greater support for the low end, i.e., 12.1%.

Volatility in the capital markets has, however, made even near-term interest rate forecasts susceptible to large errors. In light of such volatility and my market-to-book analysis, I consider the mid-point of my DCF range to be the best current estimate of the Company's bare bones cost of equity in this case. The Commission should, however, consider the outlook for cost of capital trends as they materialize and modify their findings accordingly at the time for decision in this case.

Q: SHOULD YOUR FINDINGS AS TO OG&E's COST OF EQUITY BE ADJUSTED FOR FLOTATION COSTS AND MARKET PRESSURE IN THIS CASE?

A: No. An adjustment of OG&E's bare equity rate for flotation costs and market pressure offers an insurance policy to stockholders against unfavorable markets. Premiums on this policy are paid by the ratepayers, but the stockholders are the beneficiaries. Furthermore, this policy pays benefits in the form of higher returns on equity whether or not the effects of unfavorable markets during stock sales are experienced. Since OG&E anticipates no new stock sales in the foreseeable future, except through its dividend reinvestment plan, a flotation adjustment offers clear immediate benefits to its stockholders, but no comparable benefits to the ratepayer.

Such an adjustment in this case in inequitable and should not be allowed.

Q: WHAT CAPITAL STRUCTURE HAVE YOU FOUND REASONABLE FOR OG&E?

A: The capital structure I recommend contains 46.5% long-term debt, 9.5% preferred stock, and 44.0% common equity. This structure contains slightly more debt and less equity than the structure contained in Company witness Ryan's testimony.

Q: WHY HAVE YOU REJECTED THE CAPITAL STRUCTURE RECOMMENDED BY THE COMPANY?

A: I have rejected the Company proposed capital structure because it results in accounting ratios that are in excess of those necessary to maintain the Company's credit rating. For example, the Company's pre-tax fixed charge coverage ratio calculated using its proposed capital structure and costs of capital is near 5.5 times as shown in GSA Exhibit (PRW-15). Based on the recently revised coverage requirements published by Standard and Poor's in its Credit Week dated February 18, 1985, 5.0 times is at the upper end of the acceptable range for a AA bond rating, and in fact, well within the 4.5 times lower limit specified by S & P for a AAA rating (note that S & P ranges for two different bond ratings may overlap).

Maintenance of accounting ratios near the S & P specified upper limit for a given credit rating requires higher rates for electric services yet does not guarantee higher bond ratings or lower costs of debt or equity. Unless lower debt and equity costs, sufficient to offset the higher rates necessary to achieve the high accounting ratios, are forthcoming, the maintenance of high accounting ratios are unnecessary, and inequitable to the ratepayer.

Q: DOES THE CAPITAL STRUCTURE YOU RECOMMEND PROVIDE ACCOUNTING RATIOS SUFFICIENT TO MAINTAIN THE COMPANY'S CREDIT RATING?

A: Yes, it does. As shown in GSA Exhibit (PRW-15), Part II, the pre-tax fixed charge coverage ratio associated with the capital structure I recommend is approximately 4.2 times. This ratio is within the range of 3.5 to 5.0 times S & P specifies for a AA rating and is therefore within reason, based on this primary test of earnings adequacy. The capital structure I propose is in fact, the revenue requirement minimizing capital structure given the component costs of capital and the assumption that preferred stock equals 9.5% of total capital.

Q: DOES THAT CONCLUDE YOUR TESTIMONY?

A: Yes.

Appendix A

Educational and Professional Summary

NAME: Philip R. Winter

EDUCATION:

University of Oklahoma, 1965
MA in Mathematics

BS, Southwest Missouri State College, 1964
Major: Mathematics

HONORS RECEIVED:

Cum Laude Graduate
Who's Who Among Students in American Universities & Colleges

EMPLOYMENT:

Operations Research Analyst
Rate Case Division
Office of Public Utilities
General Services Administration
Washington, DC
December, 1979 to present

Program Analysis Branch Chief
Division of Program Planning and Analysis
Department of Health , Education and Welfare
Washington, DC
February, 1979 to December 1979

Operations Research Analyst
Policy and Procedures Division
Public Buildings Service
General Services Administration
October, 1976 to February 1979

Industrial Engineer and Mathematician
Manpower and Cost Control and Research Department
U.S. Postal Service, Hq.
Washington, DC
June, 1968 to October, 1976

Publications: "Single-stage vs. Multi-stage Discounted Cash Flow Analysis for Cost of Equity Determination;" Electric Ratemaking, Vol. 1, No. 5, Oct/Nov. 1982.
Co-authored with David E. Kelley

"The Discounted Cash-flow Estimate of the Dividend
Growth Rate Revisited", (Comment on prior article), Public Utilities Fortnightly, Nov. 8, 1984, pp. 56, 57

PARTICIPATION IN REGULATORY PROCEEDINGS

Mr. Winter has testified on cost of capital issues before the following state commissions and other regulatory bodies: California, Colorado, District of Columbia, Federal Energy Regulatory Commission (FERC), Florida, Illinois, Maryland, Pennsylvania, and Texas.

BEFORE THE CORPORATION COMMISSION OF THE
STATE OF OKLAHOMA

In the Matter of the Application of OKLAHOMA GAS AND ELECTRIC COMPANY, An Oklahoma Corporation, for an Increase in its Rates and Charges for Electric Service Within the State of Oklahoma and for Other Appropriate Relief	))))))	Cause No. 29450

Exhibits of

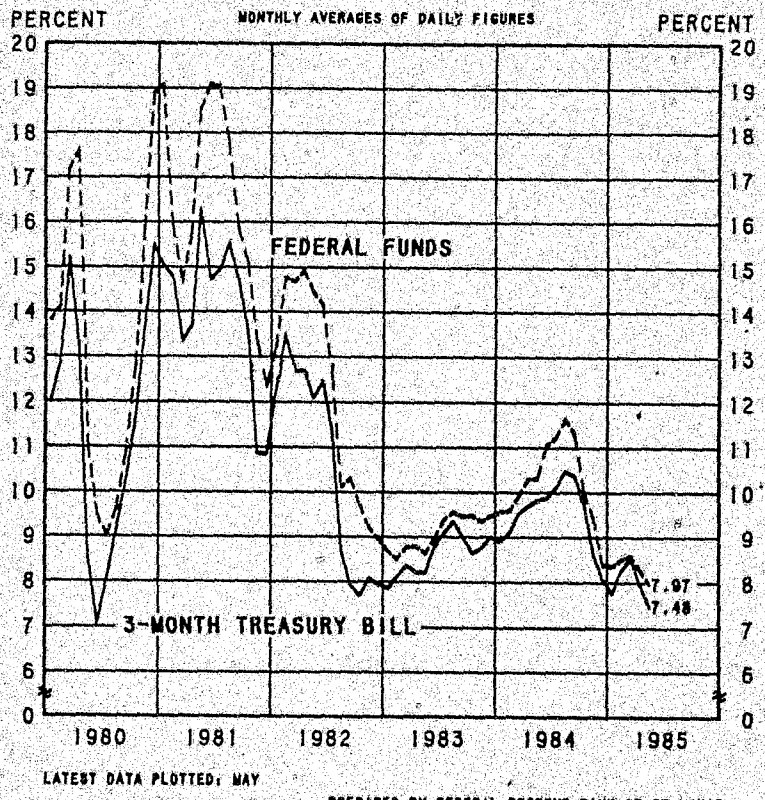
PHILIP R. WINTER

On Behalf of Intervenor
GENERAL SERVICES ADMINISTRATION

GSA EXHIBIT (PRW-1)

COMPUTATION OF OG&E's
OVERALL COST OF CAPITAL

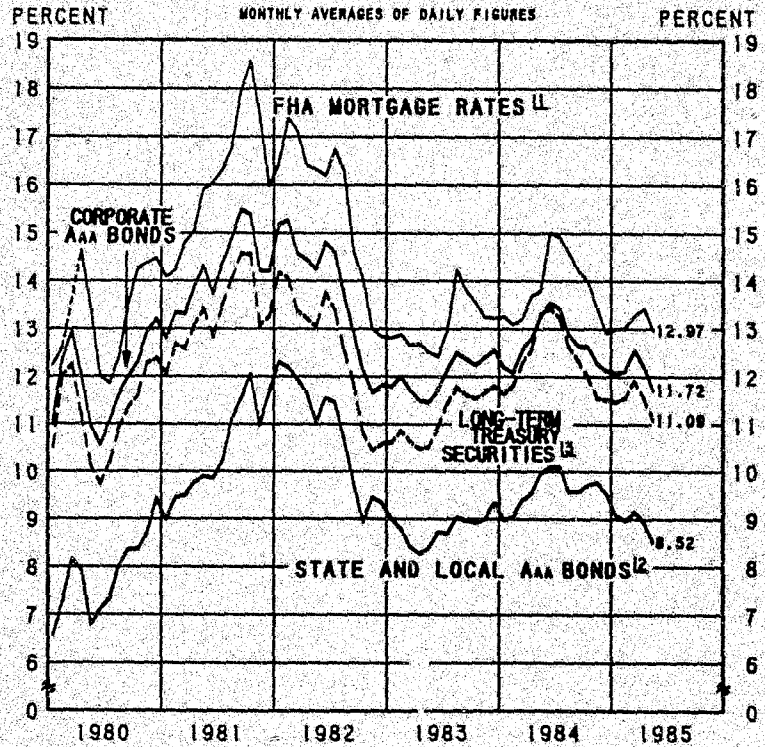
	% of Total Capital	Effective Cost (%)	Weighted Cost (%)
Long-term debt	46.5	8.48	3.94
Preferred stock	9.5	7.51	.71
Common Equity	44.0	12.50	5.50
Total	100.0%		10.15%



LATEST DATA PLOTTED: MAY

PREPARED BY FEDERAL RESERVE BANK OF ST.LOUIS

LONG-TERM INTEREST RATES



[11] FHA 30-YEAR MORTGAGES; DASHED LINES INDICATE DATA NOT AVAILABLE

[12] MONTHLY AVERAGES OF THURSDAY FIGURES

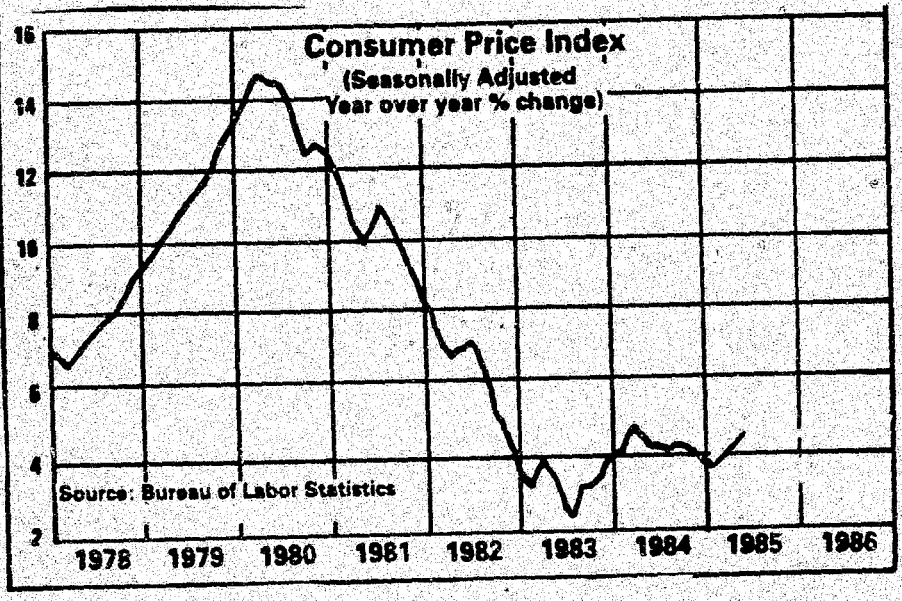
[13] AVERAGE OF YIELDS ON COUPON ISSUES DUE OR CALLABLE IN TEN YEARS OR MORE, EXCLUDING ISSUES WITH FEDERAL ESTATE TAX PRIVILEGES; COMPUTED BY THIS BANK

LATEST DATA PLOTTED: MAY

PREPARED BY FEDERAL RESERVE BANK OF ST.LOUIS

GSA Exhibit (PRW-3)

I. TRENDS IN CHANGES IN THE CONSUMER PRICE INDEX.

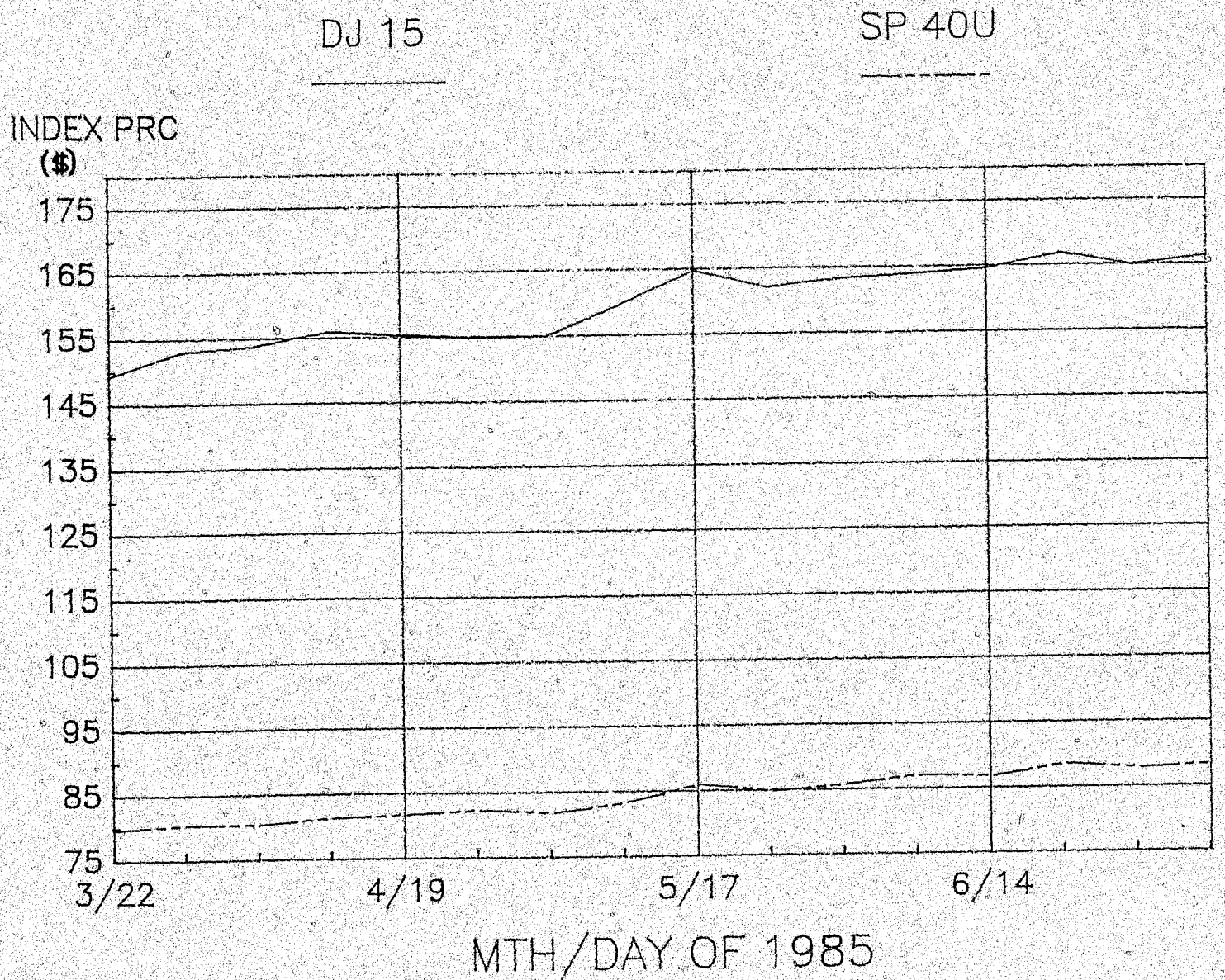


II. FORECASTS OF INFLATION IN CONSUMER PRICES (1985-1986).

	1985 over 1984(%)	1986 over 1985(%)
-L. Meyer & Associates	3.2	3.0
-Evans Economics	3.8	5.1
-Univ. of Michigan M.Q.E.M.	3.8	5.1
-Data Resources, Inc.	3.6	3.9
-University of California L.A.	3.7	4.1
-Chase Econometric	3.8	4.3
-Value Line	3.5	4.2
-Blue Chip Consensus	3.7	4.4
-Merrill Lynch	3.6	3.8
-Citicorp Information Services	4.0	5.2
-Dr. Walter W. Heller, U.of Minn	3.6	4.2
-Dr. Murray Weidenbaum, Wash. U., St. L.	3.5	4.4

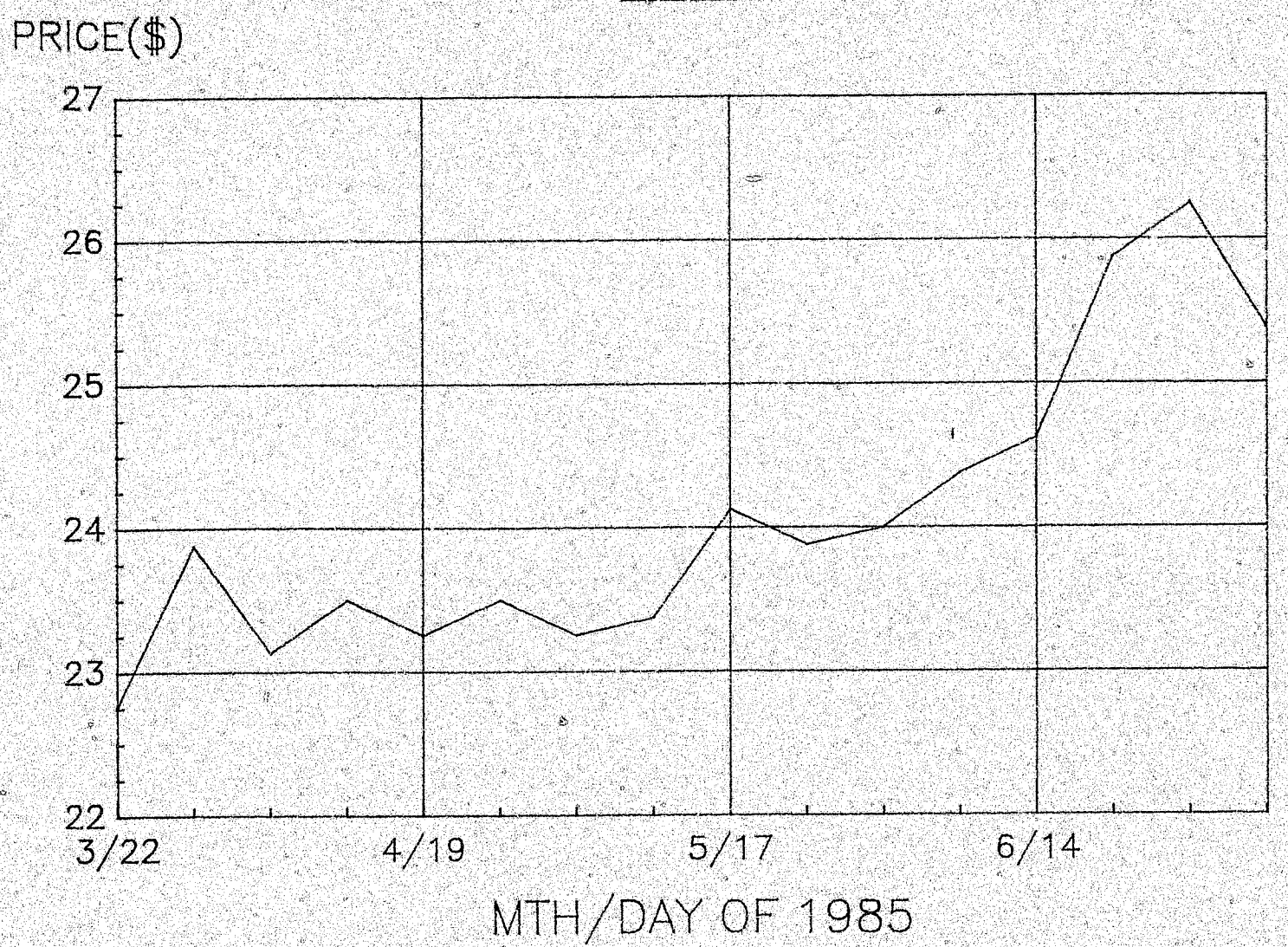
Source: Blue Chip Economic Indicators; June 10, 1985.
The Value Line Investment Survey, "Selection and Opinion", May 10, 1985

RECENT ELECTRIC UTILITY STOCK PRICE TRENDS



GSA Exhibit (PRW-4)

RECENT OG&E STOCK PRICE TRENDS



GSA Exhibit (PRW-5)

Comparison of Net Profit Margins and Return on Equity Trends for OG&E, Moody's Electric Utility Index, and Large Corporations 1981-1984

Part I:

	1981	1982	1983	1984
After-Tax Profit Margin (%):				
OG&E	9.6	11.6	11.9	11.0
Moody's Electric	11.0	11.9	13.3	12.7
Large Corporations	4.9	4.1	4.5	4.9
Return on Equity (%):				
OG&E	11.8	14.2	14.6	13.2
Moody's Electric	11.9	12.6	13.7	14.5
Large Corporations	14.0	11.0	11.5	13.2

Source: Data on OG&E and Moody's Electrics are from the Value Line Investment Survey, dated April 26, 1985 and June 7, 1985, respectively. Data on large corporations are from Business Week, dated March 15, 1982; March 14, 1983; March 21, 1984; and March 22, 1985.

Part II:

Fundamental Factors Contributing to Returns on Equity for OG&E in 1983 and 1984 and for Moody's Electrics in 1984.

	Tot. Cap. Turnover		Leverage		Pre-Tax Prof. Margin		1-Tax Rate		ROE
OG&E (1983)	.5953	x	2.2523	x	.1849	x	.589	=	.146
OG&E (1984)	.6189	x	2.1645	x	.1726	x	.571	=	.132
Moody's Electrics (1984)	.4847	x	2.4390	x	.1887	x	.650	=	.145
%Difference (OG&E vs Moody)	+27.69		-11.25		-8.53		-12.15		
%Difference (OG&E 1984 vs 1983	+ 3.96%		- 3.90%		-6.65%		- 3.06%		

Source: All calculation are based on actual and estimated data contained in The Value Line Investment Survey, "Ratings & Reports", April 26, 1985 and June 7, 1985.

GSA Exhibit (PRW-7)

ALGEBRAIC RELATIONSHIP ASSUMED IN THE DCF MODEL

(1) Infinite Model: $P_o = D_1/(1+K_1)+D_2/(1+K_2)^2+ \ldots +D_n/(1+K_n)^n + \ldots$

Where: P_o is the current price of the security
D_i is the dividend received in year i, i = 1 to oo
K_i is the investor discount rate in year i, i=1 to oo

Under simplifying assumptions of constant dividend growth and investor discount rate, this method becomes:

(2) $$P_o = D_o(1+G)/(1+K)+D_o(1+G)^2/(1+K)^2+\ldots+D_o(1+G)^n/(1+K)^n+\ldots$$

Where: D_o is the current dividend
G is the assumed constant dividend growth rate
K is the assumed constant investor discount rate

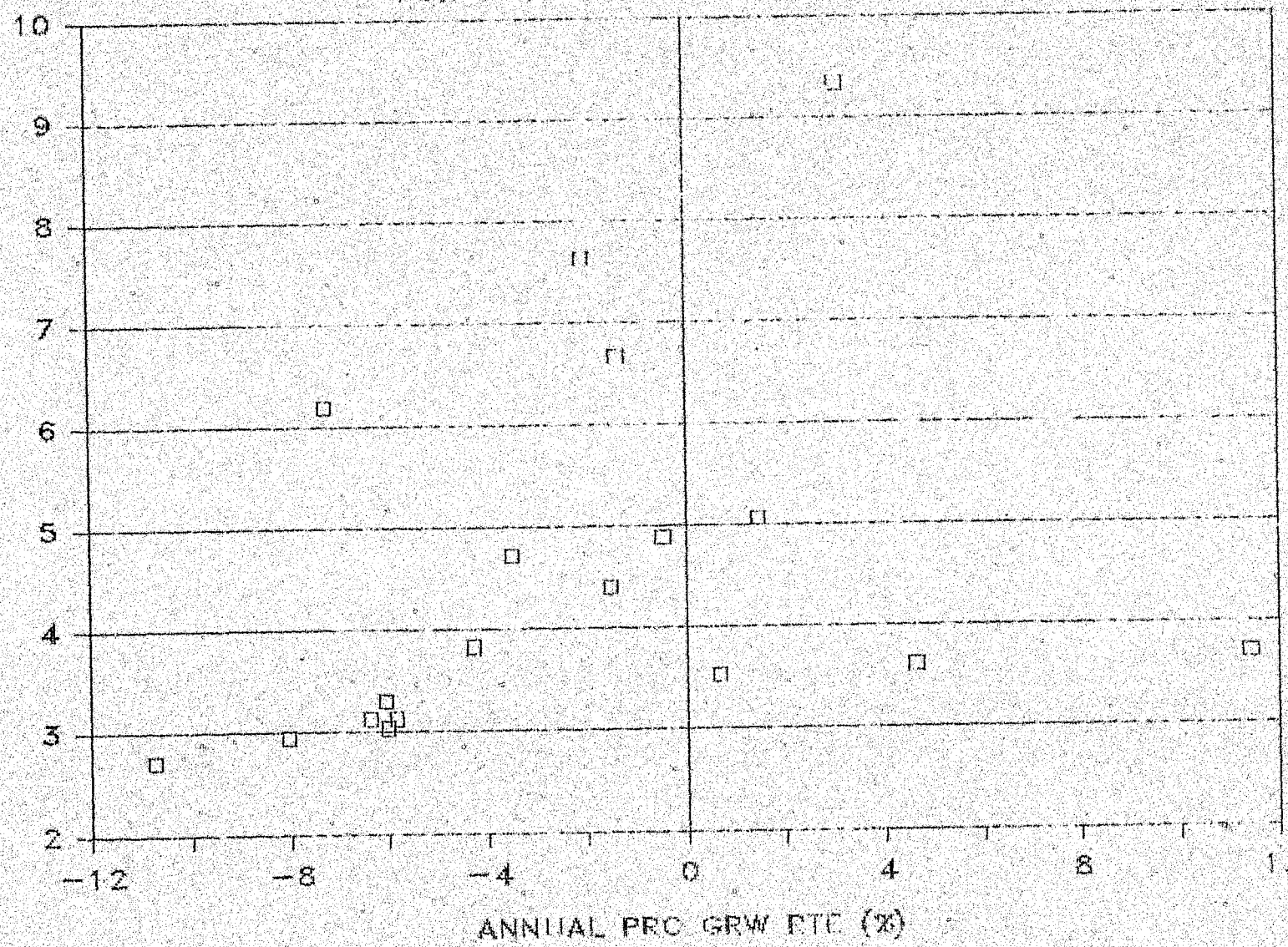
(3) Finite Model:

$$P_o = D_o(1+G)/(1+K)+D_o(1+G)^2/(1+K)^2+\ldots+D_o(1+G)^n/(1+K)^n+P_n/(1+K)^n$$

Where: P_n is expected stock price at end of a n-year finite period and constant dividend growth and investor discount rate are assumed.

O G & E PRC & DIV GRWTH HIST.

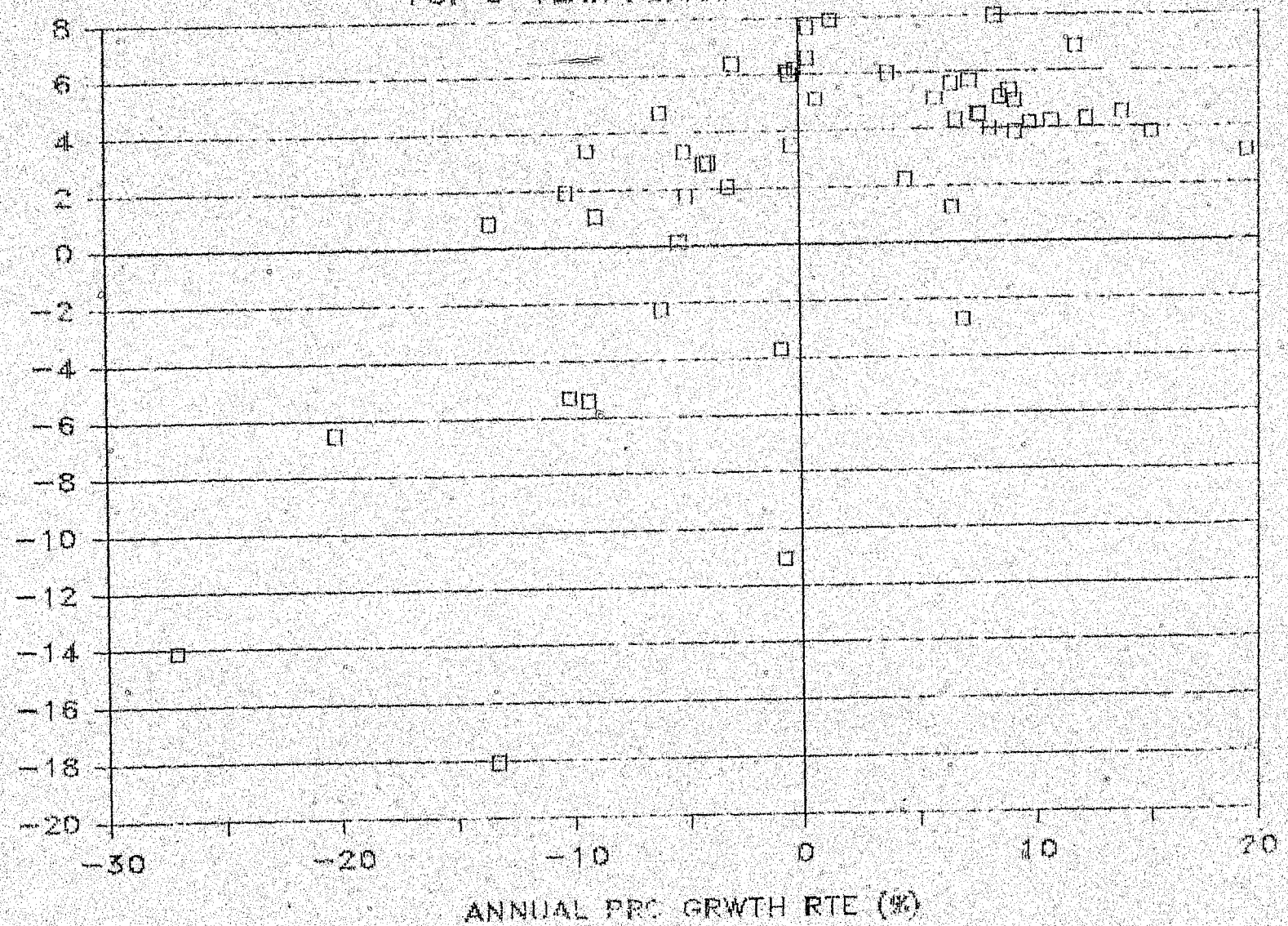
FOR 5-YEAR PERIODS 1962-1984



GSA Exhibit (PRW-8)

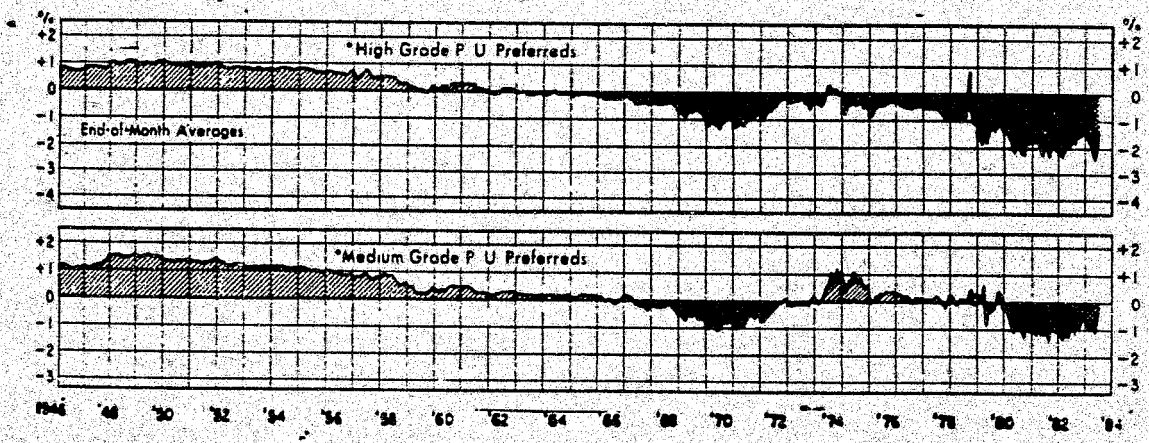
MOODY'S UTIL PRC & DIV GRWTH HIST.

FOR 5-YEAR PERIODS 1929-1984



GSA Exhibit (PRW-9)

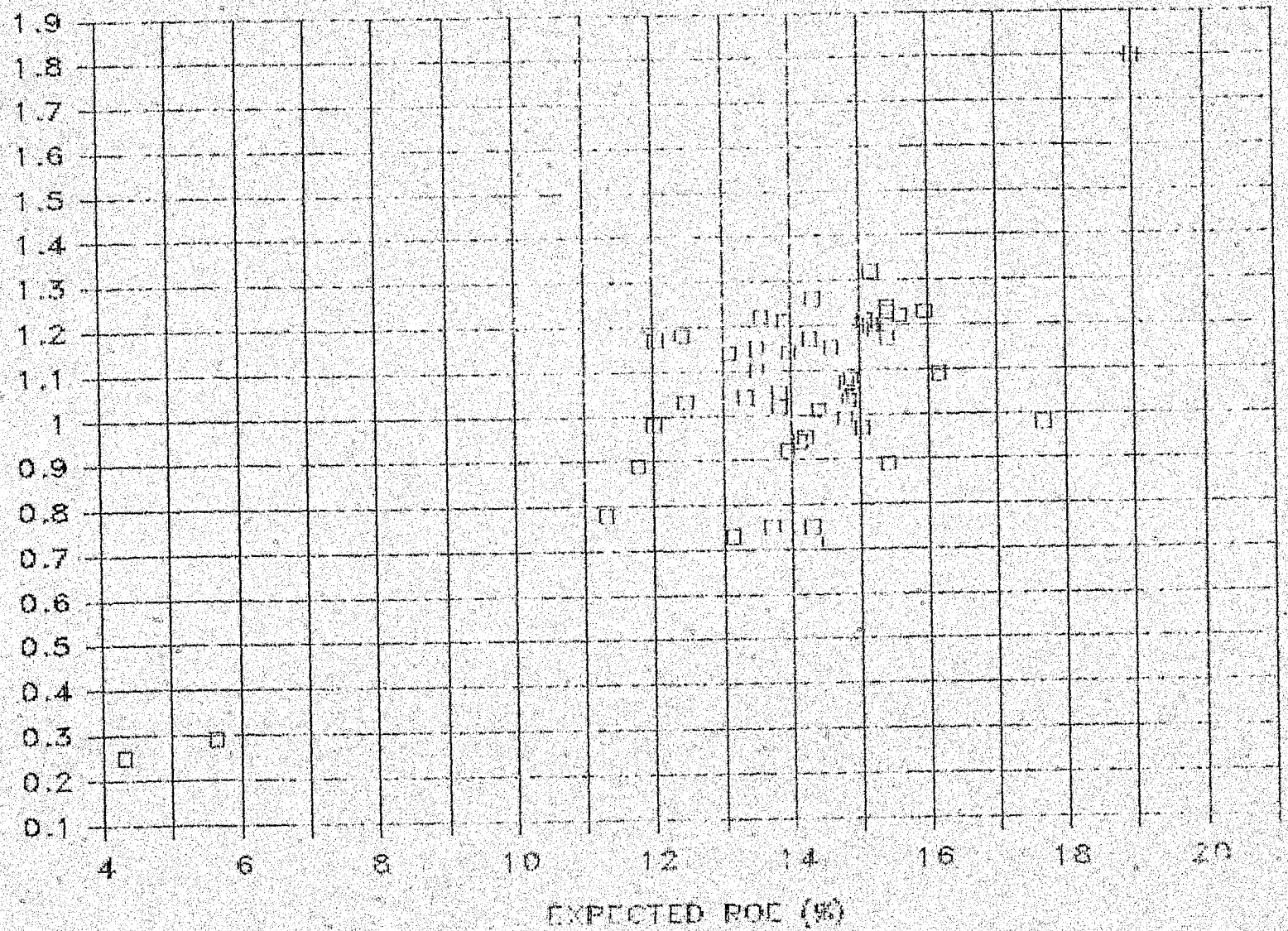
SPREADS OF PUBLIC UTILITY PREFERRED STOCKS
FROM MOODY'S COMPOSITE PUBLIC UTILITY BOND AVERAGE



Souce: Moody's Public Utility Manual, 1984, p. a9.

MKT-TO-BOOK RATIO ANALYSIS

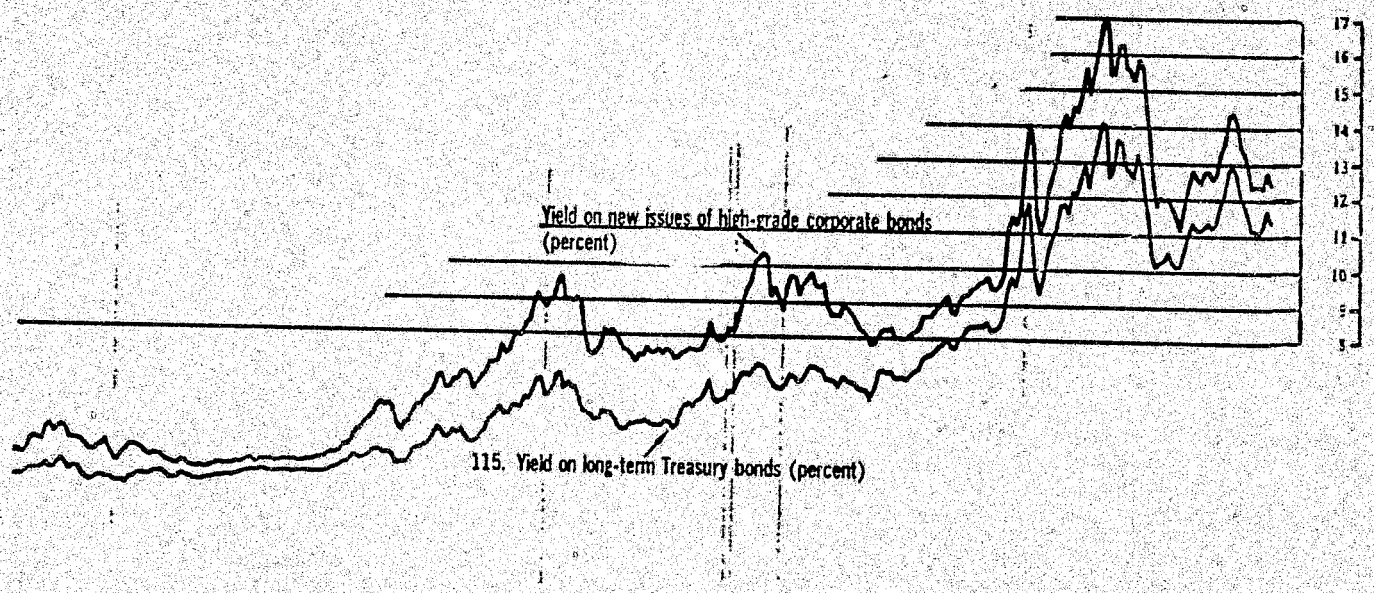
VALUE LINE DATA OF APRIL 26, 1985



GSA Exhibit (PPW-11)

COST OF CAPITAL TRENDS

1959 - 1984



SOURCE: Business Conditions Digest, April, 1985

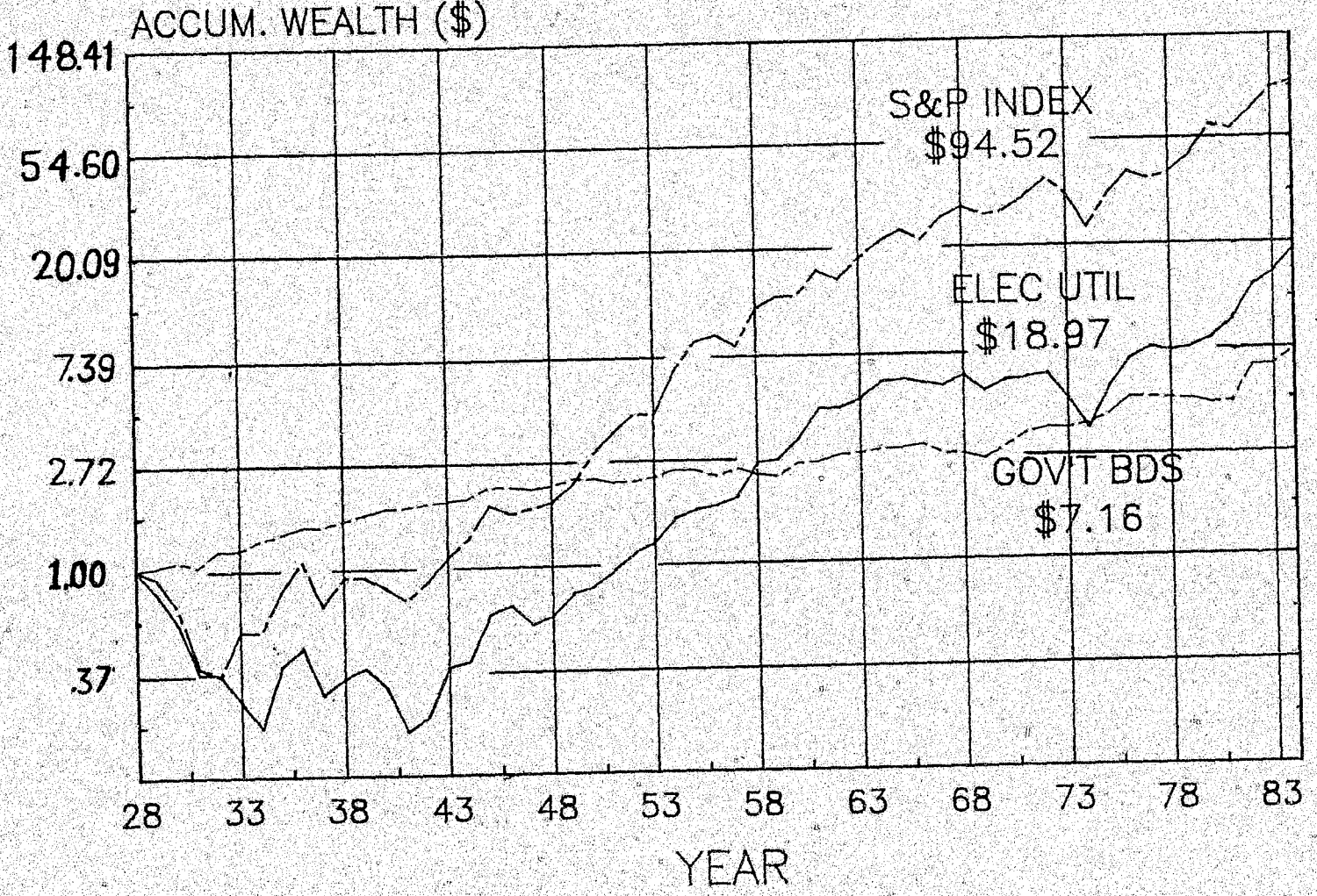
1959 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 1986

GSA Exhibit (PRW-13)

MAJOR INVESTMENT FIRMS' RECENT
SHORT-TERM GROWTH EXPECTIONS FOR OG&E
DIVIDENDS AND EARNINGS

	Expected Average Annual Growth Rates (%)	
	Dividends	Earnings
Value Line	5.2	7.1
Prudential-Bache	5.0	5.0
Merrill Lynch	4.0	5.0
Salomon Brothers	6.0	6.0
Argus	4.5	4.5
Duff and Phelps	-	4.0
Dean Witter	3.5	3.5
Average	4.7%	5.0%

ACCUMULATED WEALTH FROM $1.00 INVESTED AT THE BEGINNING OF 1929



GSA Exhibit (PFW-14)

GSA EXHIBIT (PRW-15)

COVERAGE RATIOS ASSOCIATED WITH DIFFERENT CAPITAL STRUCTURES

I. Company proposed capital structure and costs of capital:

Company proposal: 46.17% equity; 44.19% long-term debt; 9.64% preferred stock; 8.48% cost of L.T. debt; 16.75% cost of equity; 7.51% cost of preferred stock

$$\text{Coverage Ratio} = \frac{(.0848)(.4419)+((.0964)(.0751)+(.1675)(.4617))/.5}{(.0848)(.4419)}$$

$$= .2066/.0375 = 5.5$$

II. GSA proposed capital structure and costs of capital:

GSA proposal: 44% equity; 46.5% long-term debt; 9.5% preferred stock 8.48% cost of L.T. debt; 12.5% cost of equity; 7.15% cost of preferred stock

$$\text{Coverage Ratio} = \frac{(.0848)(.465)+((.095)(.0751)+(.125)(.44))/.5}{(.0848)(.465)}$$

$$= .1637/.0394 = 4.2$$

ORIGINAL

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DAVID B. MACGREGOR
DIAL DIRECT (215) 963-5448

January 9, 1986

RECEIVED
JAN 10 1986
SECRETARY'S OFFICE
Public Utility Commission

Jerry Rich, Secretary
Pennsylvania Public Utility Commission
P. O. Box 3265
Harrisburg, PA 17120

Re: Pennsylvania Public Utility Commission
v.
Philadelphia Electric Company, Docket
No. R-850152

Dear Secretary Rich:

Enclosed for filing with the Commission are the original and three (3) copies of the Answer of Philadelphia Electric Company to the Petition of Scott Paper Company to Intervene in the above-referenced proceeding.

As the attached Certificate of Service indicates, copies of the Company's Answer have been served on all participants in this proceeding in accordance with 52 Pa. Code §5.66.

Sincerely,

David B. MacGregor

/paa
Encl.
cc: The Honorable Joseph P. Matuschak
All Parties

RECEIVED
JAN 10 1986
SECRETARY'S OFFICE
Public Utility Commission

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

PENNSYLVANIA PUBLIC UTILITY COMMISSION :
:
: DOCKET No. R-850152
:
V. :
:
PHILADELPHIA ELECTRIC COMPANY :

ANSWER OF PHILADELPHIA ELECTRIC COMPANY
TO THE PETITION TO INTERVENE
OF SCOTT PAPER COMPANY

NOW COMES Philadelphia Electric Company ("PECO" or the "Company"), by its attorneys, and files herewith its Answer to the Petition to Intervene of Scott Paper Company ("SPC") in the above-captioned proceeding. In support thereof, the Company respectfully represents the following:

1. - 4. Admitted.

5. Denied. The Company is without knowledge or information sufficient to form a belief as to the assertion of SPC's purpose in constructing a cogeneration facility, which assertion is therefore denied.

6. SPC's reference to and discussion of federal and state statutes and regulations are conclusions of law to which no responsive pleading is required.

7. - 10. Admitted.

11. Admitted. PECO notes, however, that, in granting Occidental Chemical Corporation's Petition to Intervene, the ALJ did not rule on the appropriateness of the Company's avoided cost as an issue for resolution in the instant base rate proceeding.

12. Admitted. However, the Company notes that it has provided a tariff for back-up, maintenance, supplemental, and interruptible service in its Auxiliary Service Rider, Supplement No. 6 to Tariff Electric - Pa. P.U.C. No. 26.

13. Denied. The Company's Auxiliary Service Rider is just, reasonable, and non-discriminatory, fully complies with all applicable federal and state statutes and regulations, and has been approved by the Pennsylvania Public Utility Commission (the "Commission").

14. Admitted.

15. The Company takes no position as to the appropriate time for or the appropriate form of a proceeding in which to consider its tariff for back-up, maintenance, supplemental, and interruptible service. In further answer, the Company states its belief (for the reasons set forth in detail in its Answer to the Petition to Intervene of Occidental Chemical Corporation, which reasons will not be repeated here) that the Company's avoided cost is not an issue appropriate for resolution in the instant base rate proceeding.

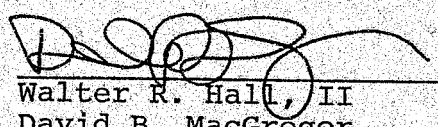
SPC's assertion that the Commission has the power to address and resolve cogeneration issues in the instant rate proceeding is a conclusion of law to which no responsive pleading is required.

16. Admitted. PECO does not oppose SPC's intervention in the proceeding. However, the Company reserves the right to challenge SPC's participation in future proceedings before the Commission or upon appeal and to contest the relevance or propriety of issues sought to be interjected into this proceeding by SPC.

17. Admitted in part, denied in part. PECO takes no position on whether SPC's Petition to Intervene is timely filed but, as stated above, does not oppose SPC's intervention in this proceeding. The Company admits that it has the burden of proof under 66 Pa.C.S. §315(a) as to the reasonableness and justness of the existing and proposed rates which the Company charges its customers and which are the subject of the instant proceeding. The Company denies that it bears the burden of proof on the issue of its avoided cost, a question inappropriate for resolution in the instant base rate proceeding, should this issue be raised by Intervenors in this proceeding. Rather, 66 Pa.C.S. §332(a) places the burden of proof on Intervenors as "proponents of a rule or order" with respect to the Company's avoided cost.

WHEREFORE, Philadelphia Electric Company, for the foregoing reasons, does not oppose Scott Paper Company's intervention in this proceeding, but respectfully requests that the Company be permitted to object to or to move to strike cross-examination, testimony, or Briefs on the avoided cost issue which Scott Paper Company may introduce into this proceeding.

Respectfully submitted,



Walter R. Hall, II
David B. MacGregor

Counsel for Philadelphia
Electric Company

OF COUNSEL:

Edward G. Bauer, Jr., Esq.
Vice President & General Counsel
Philadelphia Electric Company
2301 Market Street
Philadelphia, PA 19101

DATE: January 9, 1986

CERTIFICATE OF SERVICE

I hereby certify that I have on this day served a true copy of the foregoing Answer upon the following parties in the proceeding at Docket No. R-850152 in accordance with 52 Pa. Code §5.66.

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Philadelphia, PA 19139

David B. MacGregor
Counsel for Philadelphia Electric Company

RECEIVED
JAN 10 1986
SECRETARY'S OFFICE
Public Utility Commission

BEFORE THE PUBLIC UTILITY COMMISSION OF THE
STATE OF TEXAS

In the Matter of the Application of El Paso Electric Company, for an Increase in its Rates and Charges for Electric Service Within the State of Texas	)))))	Docket No. 6350

Direct Testimony and Exhibits of

PHILIP R. WINTER, CFA

On Cost of Capital

Witness on Behalf of Intervenor
DEPARTMENT OF DEFENSE

General Services Administration (PUR)
Room 6317
18th & F Streets, N.W.
Washington, DC 20405
(202) 566-1034

October 14, 1985

DIRECT TESTIMONY OF PHILIP R. WINTER
FOR
DEPARTMENT OF DEFENSE

Q: PLEASE STATE YOUR NAME AND YOUR BUSINESS ADDRESS.

A: My name is Philip R. Winter. My business address is Office of Public Utilities, Rate Case Division, General Services Administration, 18th and F Streets, N.W., Washington, DC 20405.

Q: WHAT IS YOUR POSITION WITH THE GENERAL SERVICES ADMINISTRATION?

A: I am an Operations Research Analyst in the Office of Public Utilities responsible for cost of capital and cost of service testimony in public utility rate cases. A statement of my educational background and professional experience is contained in Appendix A of this testimony.

Q: IN WHAT CAPACITY ARE YOU APPEARING BEFORE THIS COMMISSION?

A: I am appearing as a witness on behalf of the Department of Defense, representing the consumer interests of all Federal Executive Agencies.

Q: WHAT IS THE PURPOSE OF YOUR TESTIMONY HEREIN?

A: I address cost of capital issues, including El Paso Electric Company's (EPE or Company) cost of debt, cost of preferred and common equity, and appropriate capital structure.

Q: WHAT OVERALL COST OF CAPITAL IS APPLICABLE TO THE COMPANY IN THIS CASE?

A: The Company's overall cost of capital applicable in this case is 12.19%. The capital structure utilized in calculation of this overall cost along with my recommendations on the cost of long-term debt, preferred stock, and common equity components of the structure are shown in DOD Exhibit (PRW-1).

Q: WHAT COST HAVE YOU DETERMINED APPLICABLE TO THE LONG-TERM DEBT COMPONENT OF THE COMPANY'S CAPITAL STRUCTURE?

A: EPE's cost of long-term debt based on Company calculations as of July 31, 1985 is 10.92%. This figure has been provided in response to General Counsel data request number 9, dated September 9, 1985. The 10.92% figure is, however, in excess of the overall weighted cost of debt likely to be incurred by EPE during the rate effective period because (1) floating rate issues have been included at their weighted

life average rates and (2) issues maturing in late 1985 have been included in the calculation. For example, the Irving Trust and Chase Manhattan floating rate debt, issued in 1980 and maturing on December 2, 1985, are included at weighted life cost rates of 13.48% and 13.46%, respectively. Inclusion of these issues at weighted life costs results in an excessive estimate of EPE's embedded debt costs since interest rate declines since 1980 have led to significantly lower costs on floating rate issues and because these issues will expire at the beginning of the rate effective period.

To correct this overstatement of EPE's cost of debt, I have replaced the Irving Trust and Chase Manhattan issues with proforma issues of equal principal amounts, but lower effective costs. The cost rate I have assumed for these replacement issues is 9.5% which approximates the cost rate associated with EPE's 1985 floating rate issue and is more consistent with current capital market rates. The result of this replacement is an effective cost of EPE's debt of 10.82%. I use this 10.82% figure to calculate EPE's overall cost of capital in Exhibit (PRW-1), but recommend that the Commission adjust this rate as necessary to reflect changes in the capital markets between now and the time a decision is reached in this case. I further recommend that the Commission adjust the EPE calculated effective costs of the remaining floating rate issues if market rates for such

issues at the time of the decision differ from those shown by EPE in its response to the General Counsel's data request.

Q: WHAT COST IS APPLICABLE TO THE PREFERRED STOCK OF THE COMPANY'S CAPITAL STRUCTURE?

A: The embedded cost of the Company's preferred stock is 9.80%. Data from which this figure is calculated are also contained in the previously referenced response to General Counsel data request number 9.

Q: WHAT CONCLUSION HAVE YOU REACHED CONCERNING THE COST OF THE COMPANY'S COMMON EQUITY?

A: The current cost of the Company's common equity, is between 14.5% and 15.2%. In today's capital market, I consider the midpoint of this range, 14.85%, a reasonable point estimate of the cost of equity. Documentation of my analysis of the Company's cost of equity is contained in the following pages.

Q: WHAT CRITERIA HAVE YOU UTILIZED TO DETERMINE THE CURRENT INVESTOR REQUIRED RETURN FOR THE COMPANY?

A: I have applied the criteria established by the Supreme Court in the Bluefield and Hope decisions. In Bluefield Waterworks & Improvement Co. v. Public Service Commission of West Virginia, 262 U.S. 679, 693 (1923), the Court stated: "The return should be reasonably sufficient to assure confidence in the financial soundness of the utility and should be adequate, under efficient and economical management, to maintain and support its credit and enable it to raise the money necessary for the proper discharge of its public duties."

In addition, as an indication of an upper bound on the return and the potential instability of investor return requirements, the Court stated (262 U.S. at 692-693):

> "...[the company] has no constitutional right to profits such as are realized or anticipated in highly profitable enterprises or speculative ventures."
>
> "A rate of return may be reasonable at one time and become too high or too low by changes affecting opportunities for investment, the money market and business conditions generally."

The Hope decision (FPC v. Hope Natural Gas Co., 320 U.S. 591, 603 (1944)) provided guidelines similar to those that I initially related from the Bluefield opinion, as follows:" the return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital."

Q: DO THE CRITERIA STATED IN THESE SUPREME COURT DECISIONS INDICATE UPPER AND LOWER BOUNDS FOR THE COST OF EQUITY?

A: In a general sense, they do. The lower bound is established as the return sufficient to maintain the Company's credit in the marketplace. Indications of the sufficiency of the return are the Company's success in raising necessary capital and the similarity of the after-tax return to that after-tax return on other investments of corresponding risks. Certainly investors' capital will be attracted by those firms of corresponding risk that offer the higher after-tax returns. Unless the return offered by the regulated utility is competitive, the capital attraction criterion is unlikely to be met.

The upper bound on returns is stated to be below that realized or anticipated from highly profitable enterprises or speculative ventures. For high-grade utility firms, without consideration of the company's specific risk level, I believe yields-to-maturity on bonds rated below BBB by Standard & Poor's or Baa by Moody's, may be used as an indicator of this upper bound. Such bonds are considered to be "predominantly speculative" or have "speculative elements" according to these rating services and offer returns in excess of that generally required in the market-place.

Q: GIVEN THE GENERAL SUPREME COURT GUIDELINES, HOW HAVE YOU DETERMINED SPECIFIC BOUNDARIES FOR THE COST OF THE COMPANY'S EQUITY?

A: I have first reviewed macroeconomic conditions that define the environment for today's credit market. Included in this review were expectations for, and recent trends in, the inflation rate, current Federal Reserve policy on monetary growth, and loan demand at large commercial banks. These interrelated factors are primary determinants of the cost of money. Secondly, I have performed a current market analysis of utility stocks, in general, and of the Company's common stock to determine the Company's current cost of equity. Finally, I have reviewed cost of capital trends to draw

conclusions about the prospective cost of the Company's equity for the period during which rates from this case will be in effect.

Q: WHY DO YOU BEGIN YOUR ANALYSIS OF THE COMPANY'S COST OF EQUITY WITH A REVIEW OF CURRENT MACROECONOMIC CONDITIONS?

A: As indicated above, macroeconomic conditions including the supply and demand for funds in the U.S. economy and the rate of inflation are primary determinants of the general rates of interest (costs) on borrowed or invested capital. These general costs establish the base from which a specific company's cost of capital is determined.

Q: HOW ARE THE FEDERAL RESERVE'S MONETARY POLICY, THE INFLATION RATE, LOAN DEMAND, AND THE COST OF MONEY RELATED?

A: The interrelationships of these factors are multifaceted and complex. In basic terms, however, a tight monetary policy with stable loan demand tends to decrease the rate of inflation and place upward pressure on interest rates in the short-term. Over the long-term, interest rates would be expected to decline as inflationary pressures cool. Similarly, a policy toward increasing monetary growth with stable loan demand has tended to reduce interest rates over the short-term (due to the more plentiful supply of money),

but exert upward pressure on the inflation rate. Over the long-term, interest rates would be expected to rise with the increasing rate of inflation. Short-term effects of monetary growth on interest rates may be lessened or increased by fluctuating loan demand, level of foreign investment in U.S. securities, and changes in velocity, i.e., the average number of times per year that a dollar is used to purchase components of GNP.

For example, heavy demand for business loans during the first quarter of 1985 (loan growth at a 9% annual compound rate) placed upward pressure on interest rates even with relatively rapid growth in the money supply (9% growth in M1). Relatively flat or declining demand for business loans coupled with continued rapid growth in the money supply has more recently contributed to interest rate declines from the March, 1985, level.

Q: WHAT HAS BEEN THE RECENT MONETARY POLICY OF THE FEDERAL RESERVE?

A: Recently stated goals of the Federal Reserve are "to foster monetary and financial conditions that will help to reduce inflation further, promote growth in output on a sustainable basis, and contribute to an improved pattern of international transactions" (see Record of Policy Actions of the

Federal Open Market Committee, Meeting of July 9-10, 1985). To achieve these goals, the Federal Reserve has allowed monetary growth somewhat above its 1985 target growth range of 3% to 8% (for M1). Primary concerns of the Federal Reserve's policy committee include the large Federal deficit, the strength of the dollar and its effect on American exports, and the potential for renewed inflation. The first two concerns (the deficit and strength of the dollar) may be alleviated over the short-term by more rapid monetary growth, i.e., higher monetary growth would likely reduce interest rates thereby easing the pressures of Federal borrowing and reducing the attractiveness of the dollar. Higher monetary growth may, however, reignite inflation. In an attempt to walk the fine line between a policy that is noninflationary and simultaneously sufficient to stimulate exports (lessen the dollar's value overseas) and finance the deficit, the Federal Reserve appears to be allowing monetary growth near or above the upper end of its target range while keeping a watchful eye on inflation trends. Unless the inflation rate begins to rise, higher monetary growth will likely be tolerated.

Q: WHAT HAS BEEN THE IMPACT OF LOAN DEMAND, RECENT FEDERAL RESERVE POLICY, AND OTHER SIGNIFICANT FACTORS ON THE CREDIT MARKETS?

A: Recent interest rates on bonds and other fixed yield investments are shown in DOD Exhibit (PRW-2). Average yields on fixed income securities trended downward from the summer of 1984 through January 1985. Fixed income security yields dropped 150 to 350 basis points during this period. The Federal Reserve's restraint on monetary growth and increased loan demand in early 1985 subsequently led to a plateau in yield trends followed by increases of 50 to 100 basis points. Subsequent to mid-March, 1985, interest rates in general have dropped significantly. Declines of 150 to 200 basis points have led to the lowest yields experienced since the late 1970's. Contributing to the general declining trend in fixed income yields has been heavy foreign investment in U.S. securities, adequate money supply relative to demand, moderate levels of unemployment, and noninflationary levels of U.S. capacity utilization.

Q: HAVE INFLATION RATES ALSO BEEN IMPACTED BY FEDERAL RESERVE POLICY?

A: Yes, they have. Inflation rates have dropped significantly since the early 1980's (see DOD Exhibit (PRW-3), Part 1). Recent monthly data (for July and August 1985) show inflation rates that are among the lowest recorded in the past 20-years. These rates on an annualized basis are 2.3% 2.4% respectively, and are approximately one-fifth of the

rates recorded in 1980.

Although other independent factors such as declining oil prices and the strength of the dollar against foreign currencies have contributed to favorable inflation rate trends, Federal Reserve action has been given a major portion of the credit for bringing inflation under control.

Q: WHAT IS THE CURRENT OUTLOOK FOR INFLATION?

A: Expectations for future inflation are commonly believed to be based on historical rates with the more recently experienced rates of increase carrying the greatest weight. The pattern of inflation has stabilized since early 1984, and current low levels of inflation are generally expected in the coming months. According to the September 10, 1985 issue of Blue Chip Economic Indicators, the consensus forecast by top economists for price inflation during 1985 is 3.6%. Similar forecasts for 1986 indicate expectations for consumer prices to rise at a 4.0% annual rate. Recent inflation forecasts by major forecasting firms are shown in DOD Exhibit (PRW-3), Part II. Inflation rate expectations of these forecasters range between 3.5% and 5.0% for the period 1985-86.

Q: WITHIN THE SCENARIO DESCRIBED ABOVE OF M1 GROWTH NEAR THE UPPER END OF THE FEDERAL RESERVE TARGET RANGE OF 3% TO 8% AND A PLATEAU IN INFLATION RATE TRENDS, WHAT IS THE OUTLOOK FOR THE COST OF CAPITAL?

A: If inflation continues to fall near 3% and credit demands are consistent with allowed monetary growth without oil, or other price shocks, interest rates should decline. Alternatively, more restrictive monetary growth coupled with strong demands for credit will exert upward pressure on current rates. As reflected in the October 1, 1985 issue of Blue Chip Financial Forecasts, the consensus opinion is for small increases in capital costs with seasoned A utility bond rates ranging between 11.6% and 11.9% during the remainder of 1985 and 1986.

Q: WITHIN THE CURRENT ENVIRONMENT CHARACTERIZED BY INFLATION EXPECTATIONS OF 3% to 5% AND A MODERATE FEDERAL RESERVE MONETARY POLICY, WHAT HAS BEEN THE PERFORMANCE OF ELECTRIC UTILITY STOCKS IN GENERAL?

A: Utility stock price trends, as indicated by the Dow Jones and Standard and Poor's utility indices, are shown graphically in DOD Exhibit (PRW-4) for the period June 14, 1985 to September 27, 1985. Both indices reflect

upward price movements of 3% to 4% during the first four weeks of this period. During the remaining eleven weeks, these increases were erased as price declines totaling approximately 10% were recorded. The most recent price declines have been attributed to weak earnings growth and increased potential for rising interest rates.

Q: HAS THE COMPANY'S PERFORMANCE BEEN SIMILAR TO THAT OF OTHER ELECTRICS?

A: DOD Exhibit (PRW-5) shows EPE's stock price trend to be similar to that of the indices. Price appreciation for the stock during the initial four weeks of the period was almost 7%, somewhat above that of the indices, while subsequent declines were approximately 10%. Due to the greater price appreciation at the beginning of the period, EPE's net price decline is not as large as that recorded by the indicies.

Q: OF WHAT IMPORTANCE IS EPE'S RECENT STOCK PRICE TREND TO YOUR DETERMINATION OF THE COMPANY'S RETURN REQUIREMENTS?

A: Stock prices carry information concerning investor return expectations and requirements. Prices recorded for EPE'S stock represent the consensus opinion of the marketplace as to the stock's value given the current and prospective

growth expectations and discount rates.

Theoretically, a stock's value is equal to the present value of expected future returns from investing in the stock. The future returns are in the form of dividends and price appreciation. From a knowledge of investors' expectations for dividend growth and price appreciation, investor return requirements may be estimated. By adjusting investor return requirements for the effects of flotation cost and market pressure (if any), EPE's return requirements on equity may be estimated.

Q: IN GENERAL, WHAT IS THE RELATIONSHIP BETWEEN A COMPANY'S STOCK PRICE TREND AND INVESTOR RETURN REQUIREMENTS?

A: In general, increasing stock price trends in the short-term are a result of an increase in expected returns from the stock or a decline in investor return requirements. Similarly, decreasing stock price trends imply decreasing expected returns or rising required returns. This generalization assumes that investors' growth expectations do not change in the period of consideration.

Q: EPE'S STOCK PRICE PERFORMANCE SHOULD BE SUPPORTED BY THE COMPANY'S UNDERLYING FUNDAMENTALS. WHAT IS THE RECENT TREND IN THESE FUNDAMENTALS AND HOW DO THEY COMPARE WITH MOODY'S ELECTRICS AND WITH LARGE CORPORATIONS IN GENERAL?

A: A review of fundamental ratios indicative of EPE's recent performance (see DOD Exhibit (PRW-6)), reveals the following. EPE's after-tax profit margins increased steadily and significantly between 1981 and 1984. During this three year period, profit margins increased 45%, reflecting an annual compound growth rate of 13.2%. The Company's profit margins far exceeded those recorded by Moody's Electrics, and differences in margins became wider, as opposed to narrowing, during this period. At the end of 1984, EPE's margins were more than 2.5 times those recorded by the Moody's index of electric utilities. EPE's margins compare even more favorably with those recorded for large corporations. While large corporations recorded a drop in margins during 1982, and as of 1984 had not exceeded 1981 levels, EPE's margins were increasing rapidly.

Similarly, EPE's returns on equity (ROE) for the years 1981 through 1984 far exceeded those recorded by Moody's Electrics or the large corporations. EPE's returns on equity during this period exceeded those for the Moody's Index by 31% to 44%, and the large corporations' by 22% to

57%. While EPE and Moody's Electrics both recorded increasing ROE's over this period, ROE's reported for large corporations show a net decline.

Part II of Exhibit (PRW-6) offers insight to the factors contributing to EPE's superior ROE's during 1984, the most recent calendar year for which data are available. EPE's leverage (total capital over common equity), pre-tax profit margin, and tax flow-through rate (1-tax rate) all exceed those for Moody's Electrics. The Company's pre-tax profit margin is the most significant factor contributing to a higher ROE, and exceeds that of the average electric by 113%. Although EPE's total capital turnover rate (Revenues/Total Capital) is approximately one-half that of the utility index (due in part to EPE's sizeable construction program), the other factors listed above are sufficient to offset this lower turnover rate and lead to a net ROE difference of +31%.

Q: WHAT METHODS HAVE YOU USED TO DETERMINE THE COST OF EQUITY TO EPE?

A: To estimate return requirements, I rely most heavily on the discounted cash flow (DCF) approach, an approach that utilizes a company's stock price along with expectations for dividend growth and price appreciation, to estimate investor

return requirements. I also utilize a risk premium approach and a market-to-book ratio analysis to check the reasonableness of results from the DCF method.

Q: WHAT ASSUMPTIONS OR JUDGMENTS MUST THE ANALYST MAKE WHEN APPLYING THE DCF METHOD?

A: Primary assumptions in application of the DCF method are that the price paid for a security is an "equilibrium" price and is equal to the discounted stream of investor-"expected" dividends and price appreciation over the investor-holding period. The discount rate that equates a company's stock price to these expected returns is an indication of the investor-"required" rate of return. Algebraically, these assumptions may be expressed as shown in DOD Exhibit (PRW-7).

Q: WHAT JUDGMENTS MUST THE ANALYST MAKE BEFORE APPLYING THE DCF MODEL?

A: To apply the DCF model, the rate of return analyst must make decisions about the following items:

1. What is the investor-expected growth in dividends during the investment horizon and does the expected growth rate change over time?

2. What stock price is representative of current investor return requirements, e.g., the price of the stock on a specific date; the average price over the most recent 12 weeks, 16 weeks, or other period?

3. What is the investor's expected holding period or investment horizon, i.e., the future period over which the investor makes assumptions about potential returns?

4. What is the expected change in the stock's price during the investment horizon?

Q: WHAT FORM OR VERSION OF THE DCF MODEL HAVE YOU USED IN THIS CASE?

A: I rely on a "two-stage" model that allows explicit consideration of varying dividend growth rates over time.

Q: DOESN'T THE COMMONLY USED "YIELD PLUS GROWTH," i.e. D/P + g FORM OF THE DCF MODEL ALLOW CONSIDERATION OF GROWTH RATES THAT VARY OVER TIME?

A: No, it does not. The "yield plus growth" form of the DCF model is obtained from the longer version shown in DOD Exhibit (PRW-7) only if the assumption is made that dividends grow each year at a constant rate. In fact, if the D/P + g version is properly used, the analyst will concentrate on determination of an expected long-term growth rate as opposed to relying solely on near-term estimates. Strictly speaking, the growth rate used in this simple form of the model is assumed to continue through infinity without change.

Q: WHAT OTHER ASSUMPTIONS ARE IMPLICIT IN THE CONSTANT GROWTH MODEL?

A: The constant growth DCF model also implicitly assumes that the market price, earnings and book value of the company's common stock each grow at the same constant rate as dividends. This assumption is a characteristic of the constant growth model even though a cursory review of individual utility companies' short- or long-term performance will show that these constant growth conditions are seldom experienced. If inaccuracies associated with the

unrealistic constant growth assumption are to be minimized, the growth rate used must reflect the composite long-term growth expectations for all these elements i.e., price, dividends, earnings, and book value. Failure to consider composite growth rate expectations, especially for determination of long-term growth prospects, may lead to significant errors in DCF findings.

Q: WHY IS THE TWO-STAGE MODEL THAT CONSIDERS DIFFERING RATES OF GROWTH MORE APPROPRIATE THAN THE SINGLE-STAGE, OR CONSTANT GROWTH MODEL, IN ESTIMATING RETURN REQUIREMENTS?

A: The rate of utility company dividend and price growth has varied widely over past time periods. Although changes occur, from time to time, in the structure of the utility industry, I am aware of no such changes that have altered the prospective pattern of dividends and price growth. The investment community does, in fact, expect some variation in price and dividend growth over future holding periods. Given these expectations, a multistage DCF model that allows explicit consideration of varying growth rates is more appropriate for use in estimating investor return requirements.

Q: WHAT HAVE BEEN THE PAST PATTERNS OF DIVIDEND AND PRICE GROWTH FOR EPE AND OTHER REGULATED UTILITIES?

A: Dividend and price growth patterns of EPE and Moody's Electrics provide insight into the variability that may occur. EPE's 5-year holding period growth patterns are shown for 1961 through 1984 in DOD Exhibit (PRW-8). The EPE data show dividend growth rates varying between approximtely 3.4% and 9.1% dependent on the holding period. Price growth rates have varied even more widely, with annual compound rates of growth ranging between -9.2% and +7.1%. Of equal significance from a DCF analyst's point of view, is the fact that price and dividend growth differ markedly over the same holding period. This fact is apparent from the graph in PRW-8 by noting that the plotted points don't, as a rule, lie along a 45° diagonal through the origin. As emphasized earlier, the DCF model growth rate(s) must be representative of expectations for both price and dividends. Concentration by the analyst on one of these inputs to the DCF model without consideration of the other, may lead to sizeable errors in results.

Similar data for Moody's Electric utilities in DOD Exhibit (PRW-9) offer additional evidence of the likely variability in dividend and price growth rates over time and in dividend and price growth for the same holding period. This evidence

again supports the appropriateness of a multistage DCF model and the need to consider expectations for the composite of dividend and price growth.

Q: WHY DO PAST PATTERNS IN PRICE AND DIVIDEND GROWTH AFFECT CURRENT INVESTOR EXPECTATIONS?

A: Investors learn from past experience and are aware of the historical swings in dividend and price growth rates. They will therefore temper their future expectations with this knowledge. Whereas over the near term, investors may expect continuation of relatively high rates of dividend growth, such growth is unlikely to continue over extended periods. This fact is fully support[illegible] historical data. Similarly, investors do not expect unreasonably low growth rates to continue uninterrupted.

Q: IS THE TWO-STAGE, OR MULTISTAGE, DCF MODEL ACCEPTED IN THE INVESTMENT AND ACADEMIC COMMUNITIES?

A: Yes, it is. Kidder, Peabody; Prudential-Bache; Salomon Brothers; Drexel, Burnham and Lambert; Goldman, Sachs & Co.; and others currently use multistage DCF models to estimate investor return expectations on common stock. Also academicians, such as David Hawkins of Harvard University, Eugene Brigham of the University of Florida, and Fred Weston

of the University of California (Los Angeles), recognize the need for multistage models in texts they have authored.

Q: WHAT ARE THE BOUNDARIES OF THE TWO GROWTH PERIODS YOU EMPLOY IN THE DCF MODEL AND WHAT IS THE LOGIC FOR YOUR SELECTION OF THESE BOUNDARIES?

A: I recommend a DCF model of the following form:

$$P = \sum_{i=1}^{4} D(1+g_1)^i/(1+k)^i + \sum_{i=5}^{\infty} D(1+g_1)^4(1+g_2)^{i-4}/(1+k)^i$$

where "P" and "D" are the current price and dividend, respectively, "g_1" is the average annual growth rate expected within the next four years, "g_2" the average annual growth expected over the long term, and "k" is the investor-required return.

The near-term boundary defines a four-year forecast period. Forecasts covering a period of this length are frequently published by investment services and are generally available to investors. Value Line, Dean Witter, Merrill Lynch, and Salomon Brothers are among the better known firms providing forecasts for this period.

Because of the broad circulation of such forecasts and the relative accuracy with which four-year forecasts may be

made, I believe this period receives particular attention by investors. Forecasts and expectations beyond the three to five year period become less certain and may vary widely. Using the above rationale, I have selected a four-year period for the initial stage of the DCF model.

Q: ON WHAT DATA HAVE YOU RELIED TO ESTIMATE GROWTH RATES APPROPRIATE FOR USE IN THIS MODEL?

A: I rely on investment firm growth forecasts for EPE for both the near- and long-term. In addition, I have reviewed long-term growth histories for both regulated and unregulated firms.

Q: WHAT ARE INVESTMENT FIRM FORECASTS FOR EPE GROWTH DURING THE FIRST STAGE OF THIS MODEL?

A: Relying on the most recent reports available from various investment firms, I have found the following. Value Lines's forecasts, dated July 26, 1985, indicate expectations for annual dividend, earnings, and book value growth from the end of 1985 to the end of 1989 to average 6.3%, 5.3%, and 6.8%, respectively. Prudential-Bache in its July, 1985 Quantum report, expects 5-year dividend and earnings growth of 4% and 3%, respectively. Merrill Lynch in its September 1985, Quantitative Analysis report projects five-year growth

rates for dividends and earnings to be 4.7% and 2.7%, respectively. Salomon Brothers' September 4, 1985, Electric Utility Monthly indicates expectations for a 5.0% rate of growth during the next five years. Duff and Phelps' April 12, 1985 Common Stock Summary reports expectations for little, or no, earnings progress through 1988 followed by annual growth rates near 6.0%. Finally, Dean Witter's September 19, 1985 Equity Research publication contains a 5-year growth forecast for EPE of 5%. Near-term dividend growth rates estimated by these investment firms range between 4.0% and 6.3% and are summarized in DOD Exhibit (PRW-12). The average of these growth rate forecasts falls near the upper end of the 3% to 5% growth rate range forecasted for electric utilities, in general, by E.F. Hutton in its July-August, 1985, Equity Research report.

Q: WHAT ARE YOUR FINDINGS FROM REVIEW OF SHORT-TERM HISTORICAL GROWTH RATES FOR EPE?

A: Historical, 5-year holding period, price and dividend growth rates are shown in DOD Exhibit (PRW-8). For the ten most recent 5-year holding periods with end of calendar year boundaries, e.g., Dec. 31, 1979 to Dec. 31, 1984; Dec. 31, 1978 to Dec 31, 1983, dividend growth rates have ranged between 3.4% and 6.1%. Price growth rates during these same ten, 5-year holding periods have not kept pace with

dividend growth, and price declines have frequently been recorded.

Q: WHAT IS YOUR CONCLUSION CONCERNING EPE's NEAR-TERM GROWTH RATE?

A: Based on review of forecasts from investment services and the historical short-term growth history, expectations for short-term growth vary widely between 3.0% and 6.3%. For purposes of DCF analysis in this case, I consider short-term growth rates of 4.5% to 5.0% to be representative of most investors' expectations for EPE. The 5.0% figure is the average of the investment firm dividend growth forecasts shown in DOD Exhibit (PRW-12). The 4.5% lower end of the range is supported by the average of recently recorded actual short-term growth rates for EPE's dividend. I employ this range of growth rates in the two-stage DCF model, along with long-term growth expectations, to estimate current investor return requirements.

Q: WHAT ARE INVESTORS' EXPECTATIONS FOR GROWTH DURING THE SECOND STAGE OF THIS MODEL?

A: Beyond the four-year period, it is unreasonable to believe that either unusually high, or unusually low, current growth is expected by investors over the long term. I therefore

rely on investment firm forecasts of long-term growth potential and on actual long-term growth rates for regulated utilities and unregulated firms. The electric utility industry as represented by Moody's Utility Index, experienced annual growth rates in dividends and price over the long-term of approximately 3.0%. As for unregulated firms, the DOW Industrial Index has recorded long-term dividend and price growth rates of approximately 3.7% and 4.2%, respectively.

As for long-term growth forecasts from investment firms for EPE, Merrill Lynch is the only firm that regularly makes such forecasts available. Its previously referenced September 1985 report indicates long-term, steady-state, growth expectations of 4.4%.

The long-term growth histories and the investment firm forecast range between 3% and 4.4%. Relying on the long-term growth histories for indices of regulated and unregulated firms, I consider 3.7% the mid-point of the historical range to represent the lower end of the long-term growth rate appropriate for use in my two-stage model. Both unregulated firms and regulated electric utilities have demonstrated an ability to maintain long-term price and dividend growth at this rate. I consider 4.4% reasonable for the upper end of my long-term growth rate range since it

is consistent with the investment firm forecast and representative of more recent growth within the industry. Although the 4.4% rate exceeds the long-term experience of regulated utilities, it is near current expectations for long-term price inflation and is therefore within reason.

Q: WHAT IS THE CURRENT DIVIDEND YIELD TERM OF YOUR DCF EQUATION AND HOW WAS IT DERIVED?

A: The current dividend yield (D_o/P_o) is 10.1%. This yield is computed as the average of the quotients of end-of-week stock prices and effective annual dividend rates from the most recent 16-week period (6/14/85-9/27/85). A period of this duration is necessary to mitigate the effects of temporary price fluctuations. Also the 16-week period, as opposed to a shorter period, is less likely to be fully contained within a peak or valley in the price pattern.

If significant trends in price movement are observed during the period, information conveyed by these trends should be incorporated in the final decision concerning the cost of equity. EPE's stock price varied from $13.25 to $15.875 during this period, based on end-of-week prices, and the indicated annual dividend increased from $1.46 to $1.52 per share in August.

Q: WHAT ARE YOUR CONCLUSIONS FROM THE TWO-STAGE DCF MODEL CONCERNING INVESTOR RETURN REQUIREMENTS ON EPE's STOCK?

A: A current dividend yield of 10.1% coupled with near- and long-term expected growth rates of 4.5% to 5.0% and 3.7% to 4.4%, respectively, indicate investor requirements of between 14.5% and 15.2%. In terms of the "yield plus growth" or "constant growth" model, my analysis indicates investors expect constant annual dividend and price growth rates between 4.0% and 4.6%, i.e., 14.5 = (1.04) 10.1 + 4.0 and 15.2 = (1.046) 10.1 + 4.6.

Q: WHAT ARE THE POINTS OF DISAGREEMENT BETWEEN YOUR DCF RESULTS FOR EPE's AND THOSE OF COMPANY WITNESS JOHNSON?

A: Mr. Johnson's DCF finding of a 16.90% cost of equity for EPE (Johnson Testimony, p. 21) is based on analysis of company specific dividend yield and prospective growth rates and on a group of comparison electric companies. His DCF yield findings for the comparison companies ranged from 10.75% to 12.84% and the company specific yield was 11.74% His DCF yield findings differ from mine because he relies on EPE stock price data that reflect investor expectations and return requirements in calendar year 1984 and during the four quarters ending March 31, 1985 (Johnson Testimony, p. 16).

DOD Exhibit (PRW-2) depicts the significant decline in costs of capital that have occurred subsequent to a relative peak in yields during the middle of 1984. The 1984 period also reflects a period during which EPE's stock price was at its lowest level since 1982. The recovery of EPE's price since that time has led to significant declines in EPE's dividend yield. If Mr. Johnson would rely on yield data indicative of more recent investor requirements, his DCF findings would be reduced approximately 160 basis points.

As for Mr. Johnson's growth rate findings of 5.35% for EPE, this rate is excessive in comparison to expectations in the investment community and historical growth rates. Merrill Lynch's long-term growth forecast for EPE is only 4.4% and all but one of the five near-term, investment firm dividend growth rate forecasts shown in DOD Exhibit (PRW-12) fall below Mr. Johnson's findings. As shown in DOD Exhibit (PRW-8), EPE has only once during the past 23-years, recorded short-term (five-year), concurrent dividend and price growth rates equal to or in excess of Mr. Johnson's finding. Moody's utilities historical growth has also been far less than the 5.35% figure. DOD Exhibit (PRW-9) reveals just four five-year periods in the past 55-years in which both dividend and price growth for these utilities equalled or exceeded, his growth rate finding. In short, Mr. Johnson's growth rate finding for EPE is well in excess of that

indicated by the facts in this case.

Q: WHAT OTHER ANALYSIS HAVE YOU PERFORMED TO REACH CONCLUSIONS ABOUT INVESTOR RETURN REQUIREMENTS ON COMMON EQUITY?

A: As a check on the reasonableness of my DCF findings I have calculated historical risk premiums between a portfolio of utility stocks and long-term Government bonds.

I have also considered recent indications from the investment community as to the current risk premium between stocks and bonds.

Q: ARE HISTORICAL RISK PREMIUMS USED BY THE INVESTMENT COMMUNITY TO MAKE INVESTMENT DECISIONS?

A: Historical risk premiums are widely utilized by members of the investment community and are frequently included in required reading material for the training of financial analysts. The Ibbotson and Sinquefield findings have particularly widespread use and are frequently used by portfolio managers in the development of scenarios of prospective returns available from stock investments.

Q: WHAT IS THE RATIONALE FOR USE OF HISTORICAL RISK PREMIUMS?

A: The rationale underlying use of historical risk premiums is that investors are risk-averse and that incentives in the form of higher expected returns are required to convince investors to purchase more risky securities. Historical data suggest that investors have generally been rewarded for assuming such risks. As shown in DOD Exhibit (PRW-13), a portfolio of the S&P Index stocks offered the greatest total return since 1928, followed by a portfolio of utility stocks, then government bonds. These long-term returns are consistent with general perceptions of the relative risks of these three groups of securities with the higher returns associated with the more risky securities.

By comparison of historical returns from investments of differing risks, risk premiums previously available to investors may be calculated. The statistical distribution of these premiums depicts past investor experience and is indicative of premiums likely to be available in the future. Premiums falling in the tails of the distribution are improbable and, in most cases, would not be representative of investor expectations. I believe, however, that average historical premiums, for varying holding periods, and over an extended time frame, are a reasonable proxy for investor expected premiums over the long term.

Q: ARE HISTORICAL LONG-TERM RISK PREMIUMS AN ACCURATE INDICATION OF CURRENT INVESTOR REQUIREMENTS?

A: Long-term historical premiums may, or may not be representative of current investor requirements. An increase in the riskiness of bonds relative to stocks (such as that which occurred since late 1979) may, for example, reduce the risk premium between these two types of securities. Similarly, changes in the relative tax treatment of returns on bonds and stocks may change the historical risk/return relationship.

Q: WHAT HISTORICAL RISK PREMIUMS HAVE YOU FOUND BETWEEN UTILITY STOCKS AND BONDS?

A: I have found that, based on geometric mean returns, a portfolio of Moody's 24 Utilities during the period 1929 to 1984 returned approximately 182 basis points more than long-term Government bonds. To be consistent with my belief that the risk premium be based on available returns over varying holding periods and an extended time frame, I have computed the average of the premiums that would have been realized over all whole-year holding periods of one year to ten years during 1929-1984. Only those holdings periods with end-of-calendar-year boundaries were considered. The average premium from this analysis was 359 basis points for utility

stocks over Government bonds.

Q: WHAT DATA HAVE YOU USED TO CALCULATE THESE RISK PREMIUMS?

A: For Government bonds, I have used the bond data described by Ibbotson and Sinquefield in their publications of various titles, such as Stocks, Bonds, Bills, and Inflation: The Past (1926 - 1976) and the Future (1977 - 2000) and updates to these publications including Stocks, Bonds, Bills, and Inflation - 1985 Yearbook. For the utility stock data, I have relied on the monthly price and dividend data found in Moody's Public Utility Manual. These utilities include representative privately owned, electric and gas utility companies, that are dispersed geographically across the nation.

All dividends are assumed to be reinvested at the closing price for the month in which they were received. The long-term historical period chosen for analysis was 1929 to 1984. Data prior to 1929 are not available from the Moody's Manual on the Moody's stock index.

Q: HAVE SIGNIFICANT CHANGES IN THE RISK PREMIUM BETWEEN UTILITY STOCKS AND BONDS OCCURRED RECENTLY?

A: Yes, significant changes have occurred. For example, the October 1979 policy change of the Federal Reserve had a significant impact on interest rate volatility and, in turn, on required risk premiums. Although both stocks and bonds are interest rate sensitive, the greatest impact of this change has been felt in the bond market. Articles in the Wall Street Journal and Federal Reserve statistical papers have highlighted this impact. For example, an October 29, 1980, article in the Journal noted that "Bond buying these days has become a greater gamble than buying stocks. That once unthinkable notion is now widely accepted by investors ....." Also the investment firm of Goldman Sachs reported in an April 1981 research paper that the average equity risk premium over bonds was - .5% at that time.

A more recent publication from Merrill Lynch, "Valuation Perspectives", dated April, 1985 indicates that the reduced risk premiums between stocks and bonds recorded in 1979-1981 continue to prevail. This report also clearly shows that bond price volatility continues to exceed that of stocks in general.

Q: DO THE CONDITIONS THAT EXISTED DURING 1979 THROUGH 1983 CONTINUE TO AFFECT THE REQUIRED RISK PREMIUM BETWEEN UTILITY STOCKS AND BONDS?

A: Investors have not forgotten the extreme volatility and interest rate highs that occurred during this period. Although interest rates remained relatively stable during 1983, volatility has returned to the bond market in 1984 and early 1985 without a corresponding increase in stock price volatility.

The decline in volatility may be quantified by comparing the coefficients of variation (standard deviation divided by the mean) for stock and bond prices. Using Moody's monthly stock and bond data, coefficients of variation in 1983 were .027 and .014, respectively. Comparable values for the period January 1984 to September 1984 are .0428 and .0489 (stocks vs. bonds). During a more recent six month period (October '84 to March '85), coefficients of variation for utility stocks and bonds were .0274 and .0290, respectively. These comparisons reveal that stock and bond prices were more volatile in 1984 and early 1985 than in 1983, and that utility bond prices were once again more volatile than stock prices. This recent relationship between stock and bond volatility measures supports selection of the lower end of the historical risk premium range.

Q: BASED ON THE RESULTS FROM YOUR RISK PREMIUM STUDY, WHAT CONCLUSIONS HAVE YOU DRAWN CONCERNING THE REASONABLENESS OF YOUR DCF-DETERMINED INVESTOR RETURN REQUIREMENTS ON EPE'S COMMON STOCK?

A: I believe that the 182 to 359 basis point premiums calculated for Moody's 24 Utilities over long-term Government bonds should be the starting point for determining the risk premiums for EPE'S stock. These premiums represent an average of long-term historical premiums for medium grade utilities.

The increased volatility in the bond market favors the lower end of the historical risk premium range. Since the average yield on long-term Treasury securities during a recent 16-week period (6/14/85 - 9/27/85) has been 10.7%, my DCF findings of 14.5% to 15.2% offer risk premiums of 380 to 450 basis points. These premiums fall above the average premiums that have been available to investors in utility stocks over the long-term.

My DCF findings also indicate a risk premium between EPE's common equity and medium-to long-term first mortgage bonds of 240 to 580 basis points. This finding is based on recently recorded yields-to-maturity on EPE bonds that mature in 3 to 20 years. Since mid-June, 1985 these EPE

bonds have yielded 9.4% to 12.1%, with the longer term bonds requiring the higher yields. Since EPE's common equity is, in a sense, a variable rate issue with allowed returns adjusted every few years to market-based levels, the medium-term EPE bonds are the appropriate point of comparison. This comparison indicates a yield spread, or risk premium, that is fully sufficient to reward investors for investing in EPE's equity.

Q: HAVE YOU PERFORMED ANY OTHER CHECKS ON THE REASONABLENESS OF YOUR DCF FINDINGS?

A: Yes. The final check on reasonableness that I have performed is an analysis of the statistical relationship between current market-to-book ratios for electric utility companies and the corresponding expected returns on book equity. As with my risk premium analysis, my market-to-book ratio analysis is totally independent of my DCF approach and therefore offers an acceptable method for checking the reasonableness of DCF findings. The return authorized in this case should be comparable to those generally required by a utility of similar risk to EPE to allow new equity sales with net proceeds, on average, equal to book value. My market-to-book analysis will provide an indication of the level of expected returns on equity that as of July 26, 1985, correspond to market-to-book ratios near 1.0. The July 26

date is the most recent date the required data was readily available.

Q: WHAT METHOD AND DATA WERE USED IN YOUR MARKET-TO-BOOK ANALYSIS?

A: For current market-to-book ratios and expected returns on equity (ROE), I relied on the July 26, 1985, Value Line Investment Survey. Data on 47 regulated electric utilities were utilized in the analysis. Current market-to-book ratios were estimated for each company by dividing the recent market price, shown in the Value Line report, by an estimated book value. The book values utilized were estimated from the end-of-year 1984 actuals and 1985 estimates from Value Line. Value Line's estimated ROEs for 1984, 1985 and the period 1988-1990 were chosen as unbiased estimates of expected returns on book equity.

A regression equation was then fitted to the data points with the natural log of market-to-book ratio as the dependent variable and log of expected ROE and Value Line's safety ranking as the independent variables. Other independent variables, such as the company's relative return volatility (the beta coefficient), financial strength, and ratio of dividends to net profit were also considered in the analysis.

Various combinations of the independent variables were tried in an attempt to obtain the greatest explanatory power. The greatest explanatory power was offered by Value Line ROE estimates for the period 1986-1989 and Value Line's Safety ranking. These variables explained approximately 90% of the variation in market-to-book values. A plot of the relationship between the current market-to-book ratios and ROE is shown in DOD Exhibit (PRW-10).

Q: WHAT CONCLUSIONS HAVE YOU DRAWN FROM THE MARKET-TO-BOOK ANALYSIS CONCERNING THE REASONABLENESS OF YOUR DCF FINDINGS?

A: Regression analysis results reveal that an ROE of 12.81% corresponds to a market-to-book ratio of 1.0 for companies with EPE's safety ranking. While this figure falls below the lower end of my DCF range of 14.5% to 15.2%, small increases in interest rates subsequent to July, 1985, have narrowed the gap between my DCF and market-to-book ratio findings.

Under the assumption that Value Line's expected ROEs are unbiased, my market-to-book analysis indicates that my DCF findings are more than sufficient to offer an opportunity to sell new stock at prices near book value. This market-based analysis also shows that Mr. Johnson's recommend return on equity of 16.90% corresponds to a market-to-book ratio of

1.27, a ratio that is well in excess of that necessary to provide protection against stock sales at prices below book value.

Q: YOUR FINDINGS ON EPE's RETURN REQUIREMENTS HAVE VARIED DEPENDING ON THE METHOD USED. WHAT IS YOUR POINT ESTIMATE OF EPE's EQUITY RATE?

A: My point estimate for EPE's bare equity rate is 14.85% the mid-point of my DCF range. The DCF and risk premium analyses that I have performed rely on recently recorded stock prices and long-term Treasury security yields. Results are, therefore, indicative of investor return requirements during the period, 6/14/85 - 9/27/85, in which these prices and yields were recorded. My initial return on equity findings must therefore be adjusted to reflect return requirements prospectively applicable to the period during which rates from this case will likely be in effect.

In terms of the economic cycle, the remainder of 1985 and 1986 is generally expected to be one of economic expansion. I, therefore, believe it instructive to review trends in the cost of capital following past recessionary periods for information on likely future trends. Such trends are shown graphically for the period 1959 to 1984 in DOD Exhibit (PRW-11). For four of the five recessionary periods shown

interest rates have not only declined from the peak for the economic cycle, but lower levels of interest rates have remained for a number of years thereafter. The only exception to this pattern was the brief recession of 1980 that was triggered by artifical credit controls and "moral suasion" from the Federal Reserve and then affected by the upcoming election.

These past patterns in interest rates and current consensus projections for relatively small increases in interest rates provide support for the midpoint of my DCF range. Without these increases, both my risk premium findings and market-to-book ratio analysis support the lower end of my DCF range, i.e., 14.5%.

Volatility in the capital markets has, however, made even near-term interest rate forecasts susceptible to large errors. In light of such volatility and my market-to-book analysis, I consider the mid-point of my DCF range to be the best current estimate of the Company's bare bones cost of equity in this case. The Commission should, however, consider cost of capital trends as they materialize and modify their findings accordingly at the time for decision in this case.

Q: SHOULD YOUR FINDINGS AS TO EPE's COST OF EQUITY BE ADJUSTED FOR FLOTATION COSTS AND MARKET PRESSURE IN THIS CASE?

A: No. An adjustment of EPE's bare equity rate for flotation costs and market pressure offers an insurance policy to stockholders against unfavorable markets. Premiums on this policy are paid by the ratepayers, but the stockholders are the beneficiaries. Furthermore, this policy pays benefits in the form of higher returns on equity whether or not the effects of unfavorable markets during stock sales, e.g., dilution, are experienced.

Also, market pressure (positive or negative) will occur at the time of every offering whether or not, an adjustment is allowed. Negative pressure will occur, i.e., market price below that which would otherwise be recorded, without the offering if the supply of EPE shares exceeds demand for these shares. Similarly, the price of EPE shares may exceed that which would otherwise be recorded if demand exceeds supply at the time of offering.

Given the above, a flotation or market pressure adjustment in this case in inequitable and should not be allowed.

Q: WHAT CAPITAL STRUCTURE HAVE YOU FOUND REASONABLE FOR EPE?

A: I have accepted the capital structure of EPE as of July 31, 1985. At that time, it contained 52.60% long-term debt, 10.61% preferred stock, and 36.79% common equity.

Q: DOES THE CAPITAL STRUCTURE YOU RECOMMEND PROVIDE ACCOUNTING RATIOS SUFFICIENT TO MAINTAIN THE COMPANY'S CREDIT RATING?

A: Yes, it does. As shown in DOD Exhibit (PRW-14), the pre-tax fixed charge coverage ratio associated with the capital structure I recommend is approximately 3.0 times. This ratio is within the range of 2.5 to 4.0 times S & P specifies for a A rating and therefore should be sufficient to maintain EPE's current credit rating.

Q: DOES THAT CONCLUDE YOUR TESTIMONY?

A: Yes.

Appendix A

Educational and Professional Summary

INTRODUCTION: Mr. Winter is a Chartered Financial Analyst and has prepared testimony on cost of capital and other public utility regulatory issues since 1980.

EDUCATION:

University of Oklahoma, 1965
MA in Mathematics

BS, Southwest Missouri State College, 1964
Major: Mathematics

HONORS RECEIVED:

Cum Laude Graduate
Who's Who Among Students in American Universities & Colleges

EMPLOYMENT:

Operations Research Analyst
Rate Case Division
Office of Public Utilities
General Services Administration
Washington, DC
December, 1979 to present

Program Analysis Branch Chief
Division of Program Planning and Analysis
Department of Health , Education and Welfare
Washington, DC
February, 1979 to December 1979

Operations Research Analyst
Policy and Procedures Division
Public Buildings Service
General Services Administration
October, 1976 to February 1979

Industrial Engineer and Mathematician
Manpower and Cost Control and Research Department
U.S. Postal Service, Hq.
Washington, DC
June, 1968 to October, 1976

Publications: "Single-stage vs. Multi-stage Discounted Cash Flow Analysis for Cost of Equity Determination;" Electric Ratemaking, Vol. 1, No. 5, Oct/Nov. 1982, pp. 27-29.
Co-authored with David E. Kelley

"The Discounted Cash-flow Estimate of the Dividend Growth Rate Revisited", (Comment on prior article), Public Utilities Fortnightly, Nov. 8, 1984, pp. 56, 57

PARTICIPATION IN REGULATORY PROCEEDINGS

Mr. Winter has testified on cost of capital issues before the following state commissions and other regulatory bodies: California, Colorado, District of Columbia, Federal Energy Regulatory Commission (FERC), Florida, Illinois, Maryland, Oklahoma, Pennsylvania, and Texas.

BEFORE THE PUBLIC UTILITY COMMISSION OF THE
STATE OF TEXAS

In the Matter of the Application of El Paso Electric Company, for an Increase in its Rates and Charges for Electric Service Within the State of Texas	)))))	Docket No. 6350

Exhibits of

PHILIP R. WINTER, CFA

On Behalf of Intervenor
DEPARTMENT OF DEFENSE

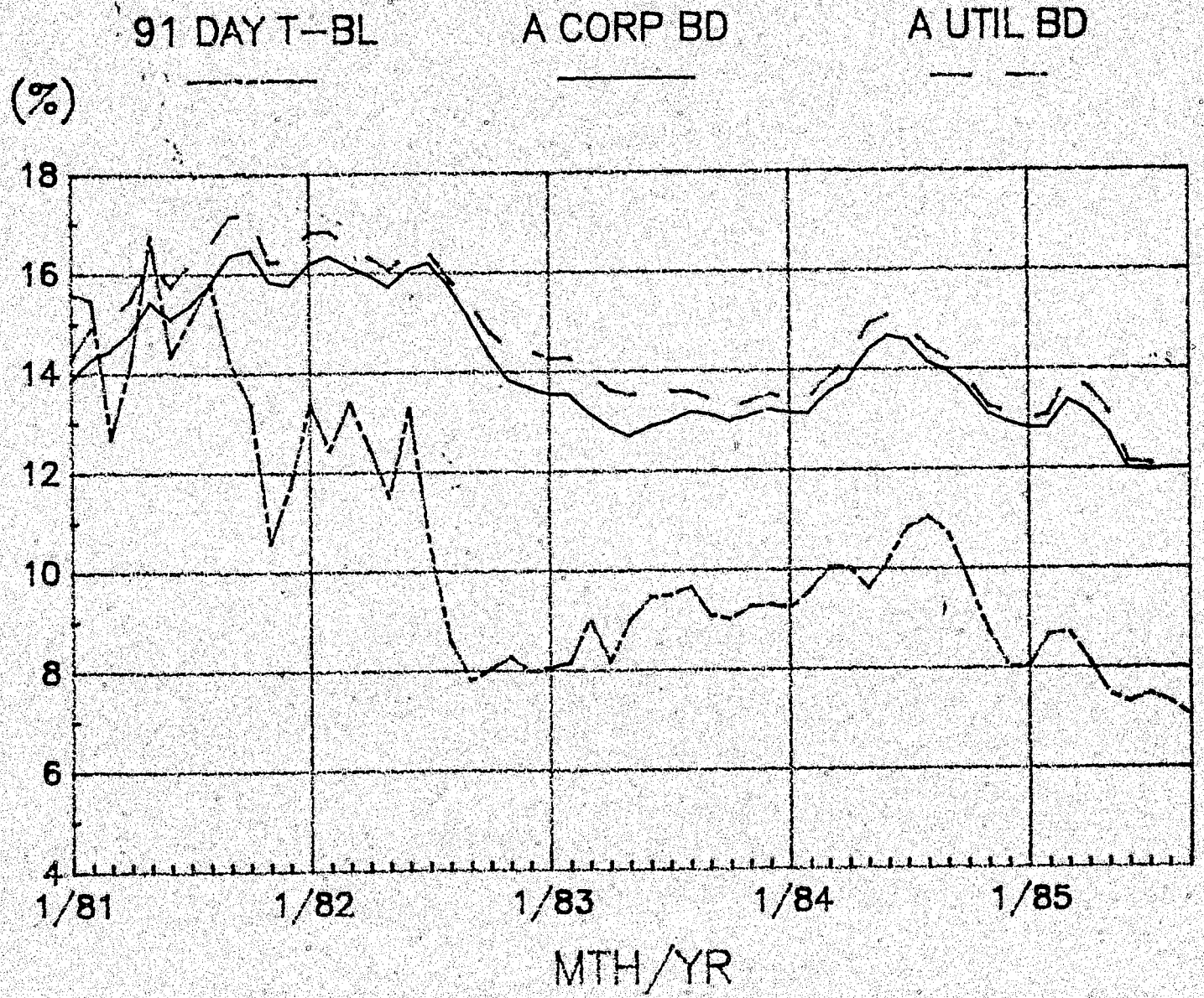
DOD EXHIBIT (PRW-1)

COMPUTATION OF EPE's

OVERALL COST OF CAPITAL

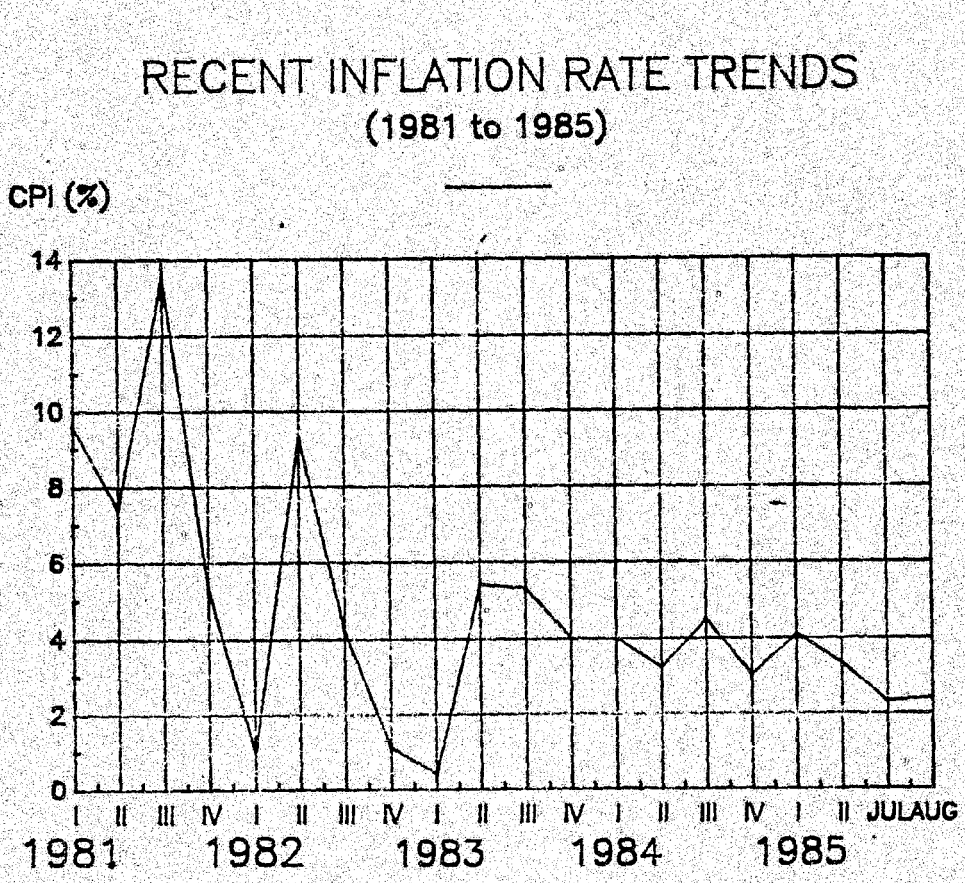
	% of Total Capital	Effective Cost (%)	Weighted Cost (%)
Long-term debt	52.60	10.82	5.69
Preferred stock	10.61	9.80	1.04
Common Equity	36.79	14.85	5.46
Total	100.0%		12.19%

INTEREST RATE TRENDS
(JAN. 1981 TO SEPT. 1985)



DOD Exhibit (PRW-2)

I. TRENDS IN CHANGES IN THE CONSUMER PRICE INDEX.



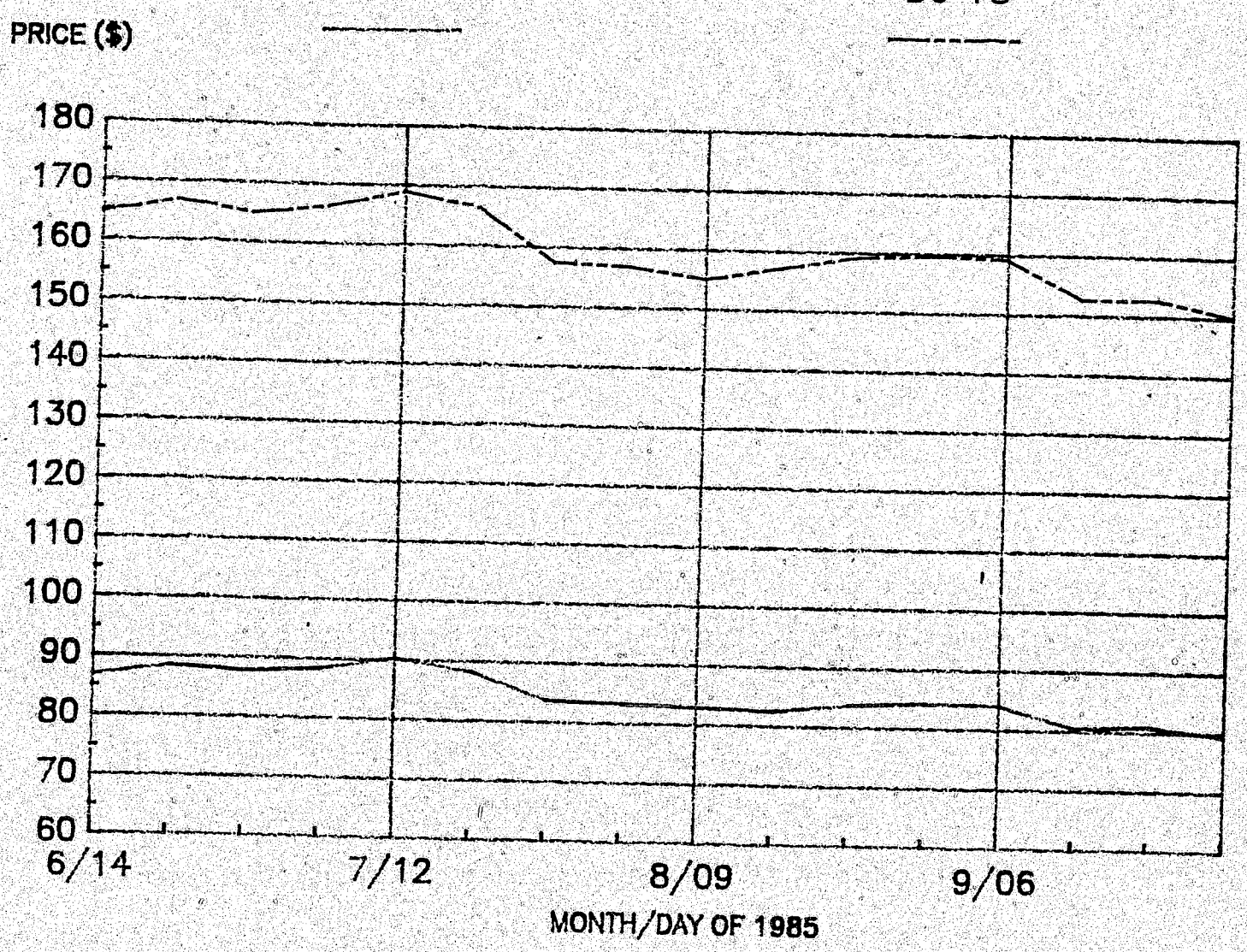
II. FORECASTS OF INFLATION IN CONSUMER PRICES (1985-1986).

	1985 over 1984(%)	1986 over 1985(%)
-L. Meyer & Associates	3.6	3.4
-Evans Economics	3.7	4.8
-Univ. of Michigan M.Q.E.M.	3.6	4.4
-University of California L.A.	3.5	3.4
-Chase Econometric	3.6	3.8
-Value Line	3.5	4.2
-Blue Chip Consensus	3.6	4.0
-Merrill Lynch	3.7	3.9
-Citicorp Information Services	3.7	5.0
-Dr. Walter W. Heller, U.of Minn	3.8	4.2
-Dr. Murray Weidenbaum, Wash. U., St. L.	3.6	4.3

Source: Blue Chip Economic Indicators; September 10, 1985
The Value Line Investment Survey, "Selection and Opinion", August 9, 1985

RECENT ELECTRIC UTILITY STOCK PRICE TRENDS

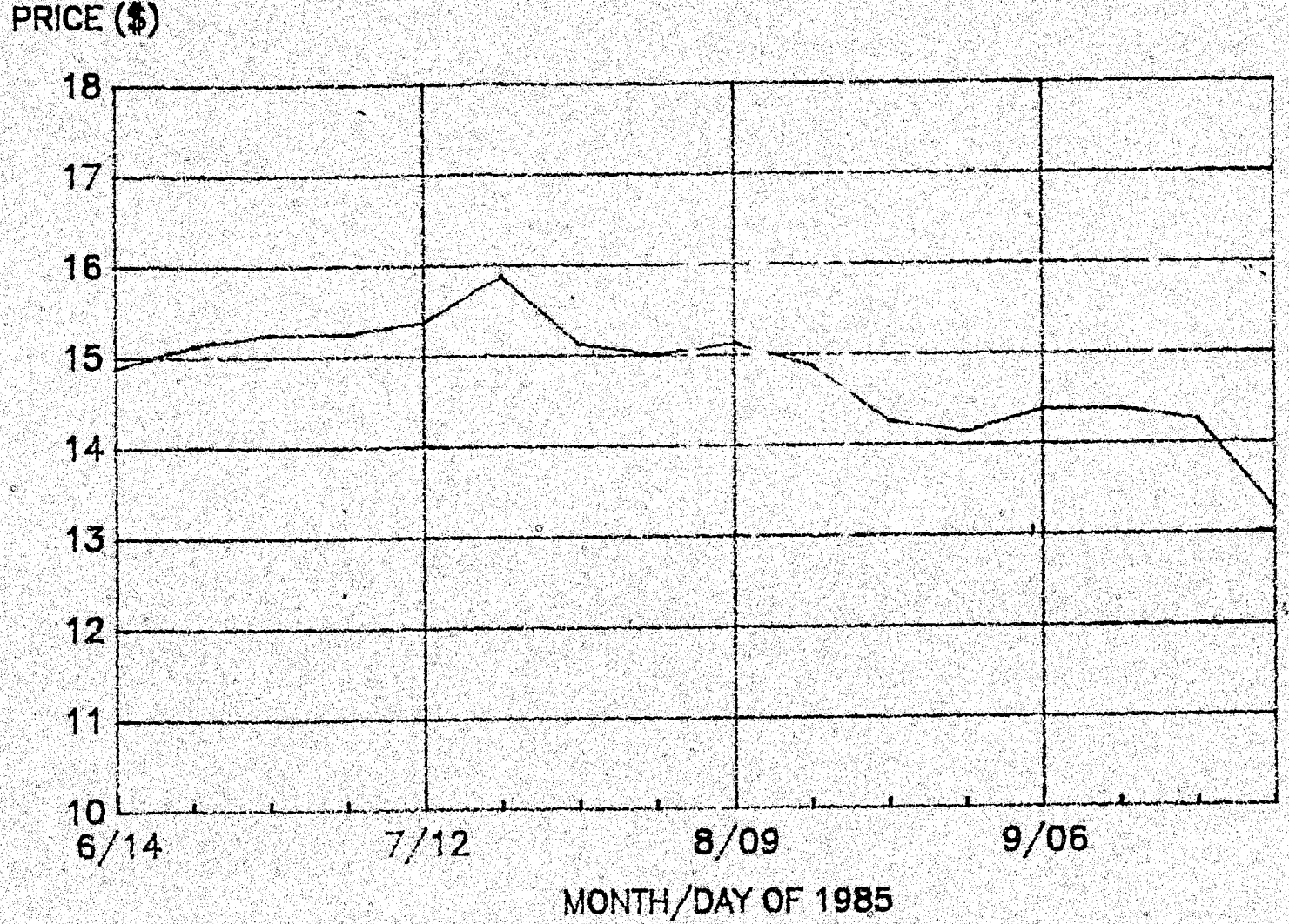
JUNE 14 TO SEPTEMBER 27, 1985



DOD Exhibit (FRW-4)

ELPASO ELECTRIC'S STOCK PRICE TRENDS

JUNE 14 TO SEPTEMBER 27, 1985



DOD Exhibit (RW-5)

DOD Exhibit (PRW-6)

Comparison of Net Profit Margins and Return on Equity Trends for EPE, Moody's Electric Utility Index, and Large Corporations 1981-1984

Part I:

	1981	1982	1983	1984
After-Tax Profit Margin (%):				
EPE	22.7	26.3	28.9	32.9
Moody's Electric	11.0	11.9	13.3	12.7
Large Corporations	4.9	4.1	4.5	4.9
Return on Equity (%):				
EPE	17.1	16.6	18.0	19.0
Moody's Electric	11.9	12.6	13.7	14.5
Large Corporations	14.0	11.0	11.5	13.2

Source: Data on EPE and Moody's Electrics are from the Value Line Investment Survey, dated July 26, 1985 and June 7, 1985, respectively. Data on large corporations are from Business Week, dated March 15, 1982; March 14, 1983; March 21, 1984; and March 22, 1985.

Part II:

Fundamental Factors Contributing to Returns on Equity for EPE in 1983 and 1984 and for Moody's Electrics in 1984.

	Tot. Cap. Turnover		Leverage		Pre-Tax Prof. Margin		1-Tax Rate		ROE
EPE (1983)	.2885	x	2.3923	x	.3726	x	.700	=	.180
EPE (1984)	.2489	x	2.6455	x	.4036	x	.715	=	.190
Moody's Electrics (1984)	.4847	x	2.4390	x	.1887	x	.650	=	.145
%Difference (EPE vs Moody)	-48.65		+8.47		+113.88		+10.00		+31.03
%Difference (EPE 1984 vs 1983	-13.73		+10.58%		+8.32%		+ 2.14%		+ 5.56

Source: All calculation are based on actual data contained in The Value Line Investment Survey, "Ratings & Reports", June 7, 1985 and July 26 1985.

ALGEBRAIC RELATIONSHIP ASSUMED IN THE DCF MODEL

(1) Infinite Model: $P_o = D_1/(1+K_1)+D_2/(1+K_2)^2+ \ldots +D_n/(1+K_n)^n + \ldots$

Where: P_o is the current price of the security
D_i is the dividend received in year i, i = 1 to oo
K_i is the investor discount rate in year i, i=1 to oo

Under simplifying assumptions of constant dividend growth and investor discount rate, this method becomes:

(2) $$P_o = D_o(1+G)/(1+K)+D_o(1+G)^2/(1+K)^2+\ldots+D_o(1+G)^n/(1+K)^n+\ldots$$

Where: D_o is the current dividend
G is the assumed constant dividend growth rate
K is the assumed constant investor discount rate

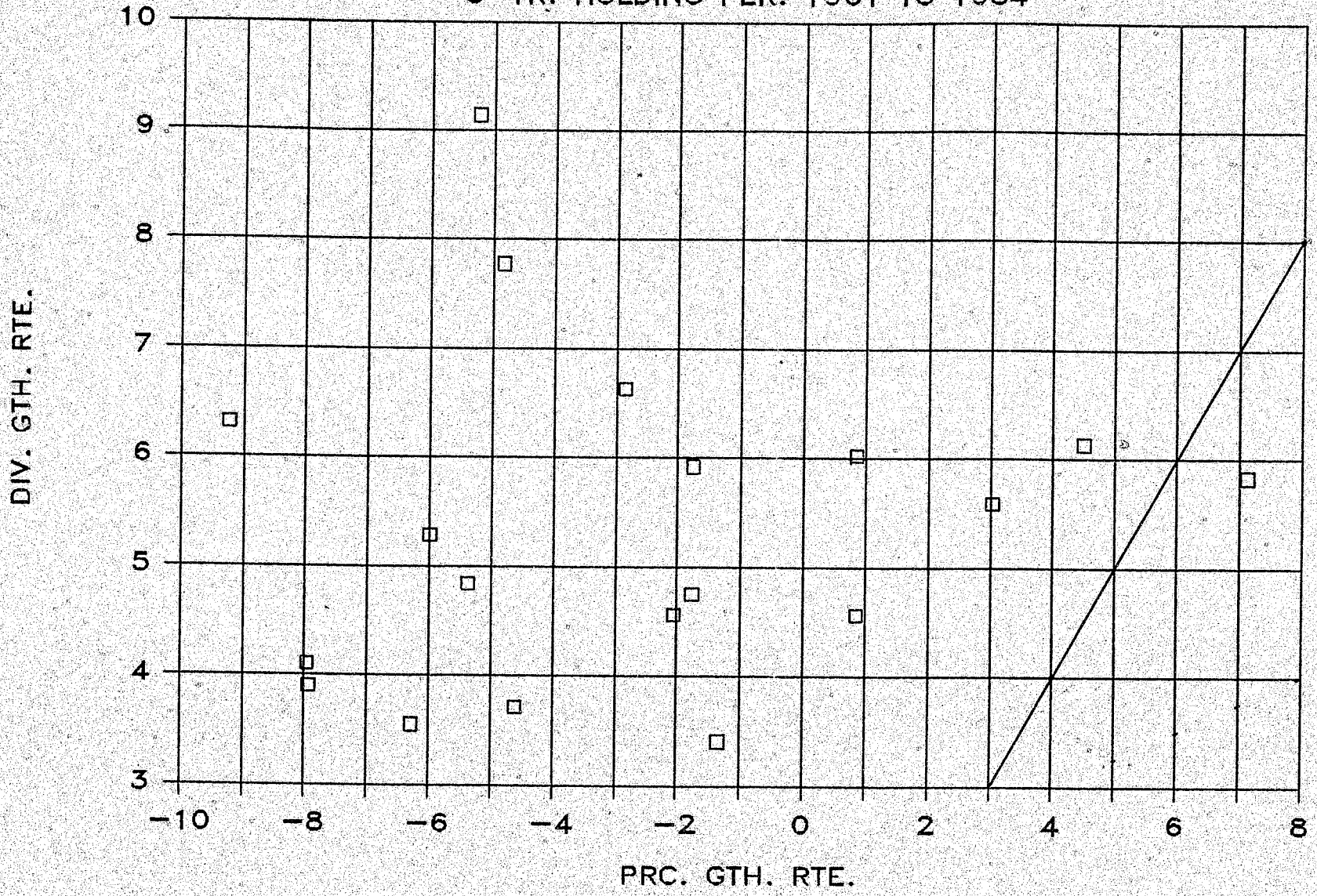
(3) Finite Model:

$$P_o = D_o(1+G)/(1+K)+D_o(1+G)^2/(1+K)^2+\ldots+D_o(1+G)^n/(1+K)^n+P_n/(1+K)^n$$

Where: P_n is expected stock price at end of a n-year finite period and constant dividend growth and investor discount rate are assumed.

ELPASO ELECTRIC'S GROWTH RATES

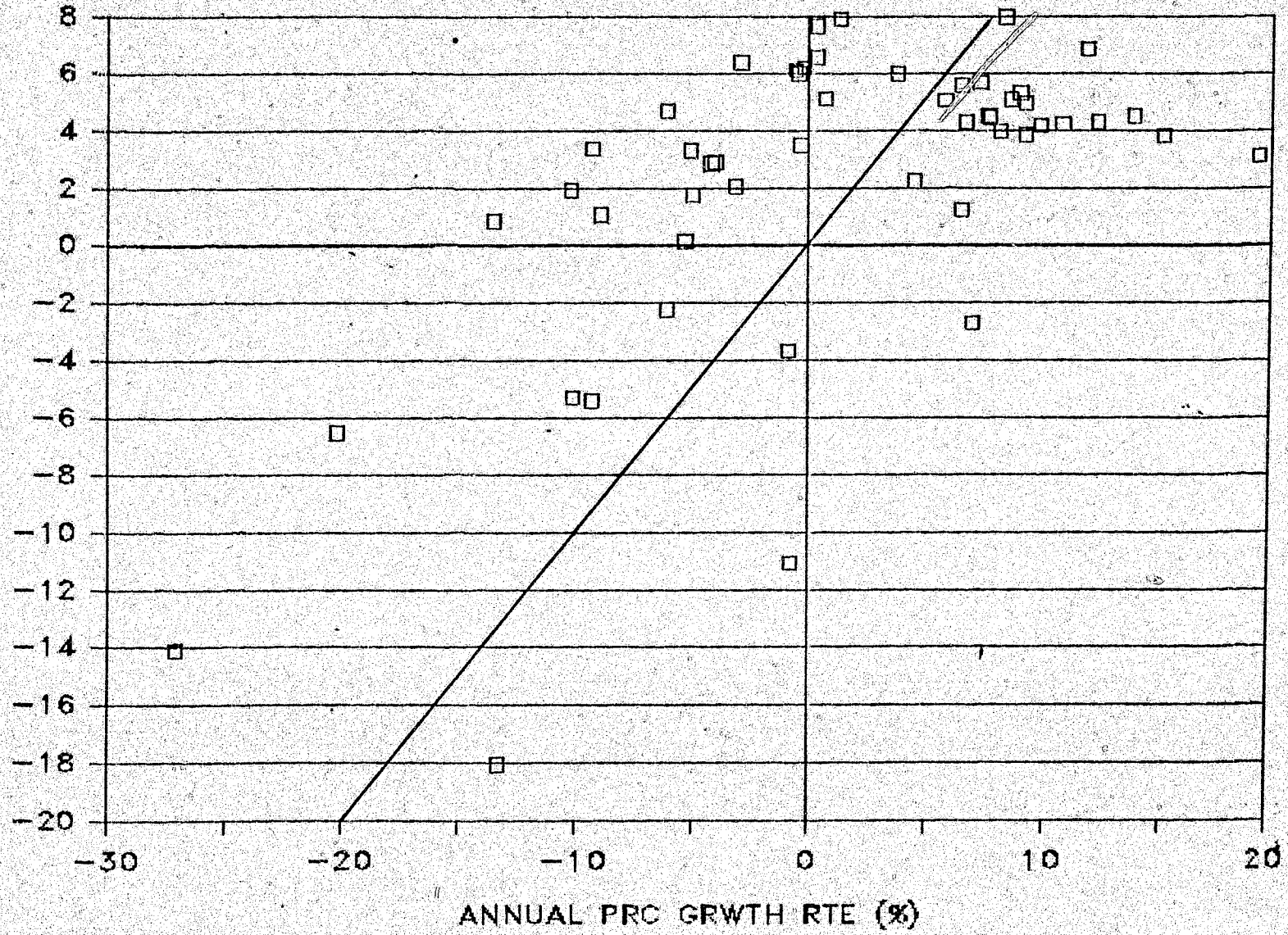
5-YR. HOLDING PER. 1961 TO 1984



DOD Exhibit (PRW-8)

MOODY'S UTIL PRC & DIV GRWTH HIST.

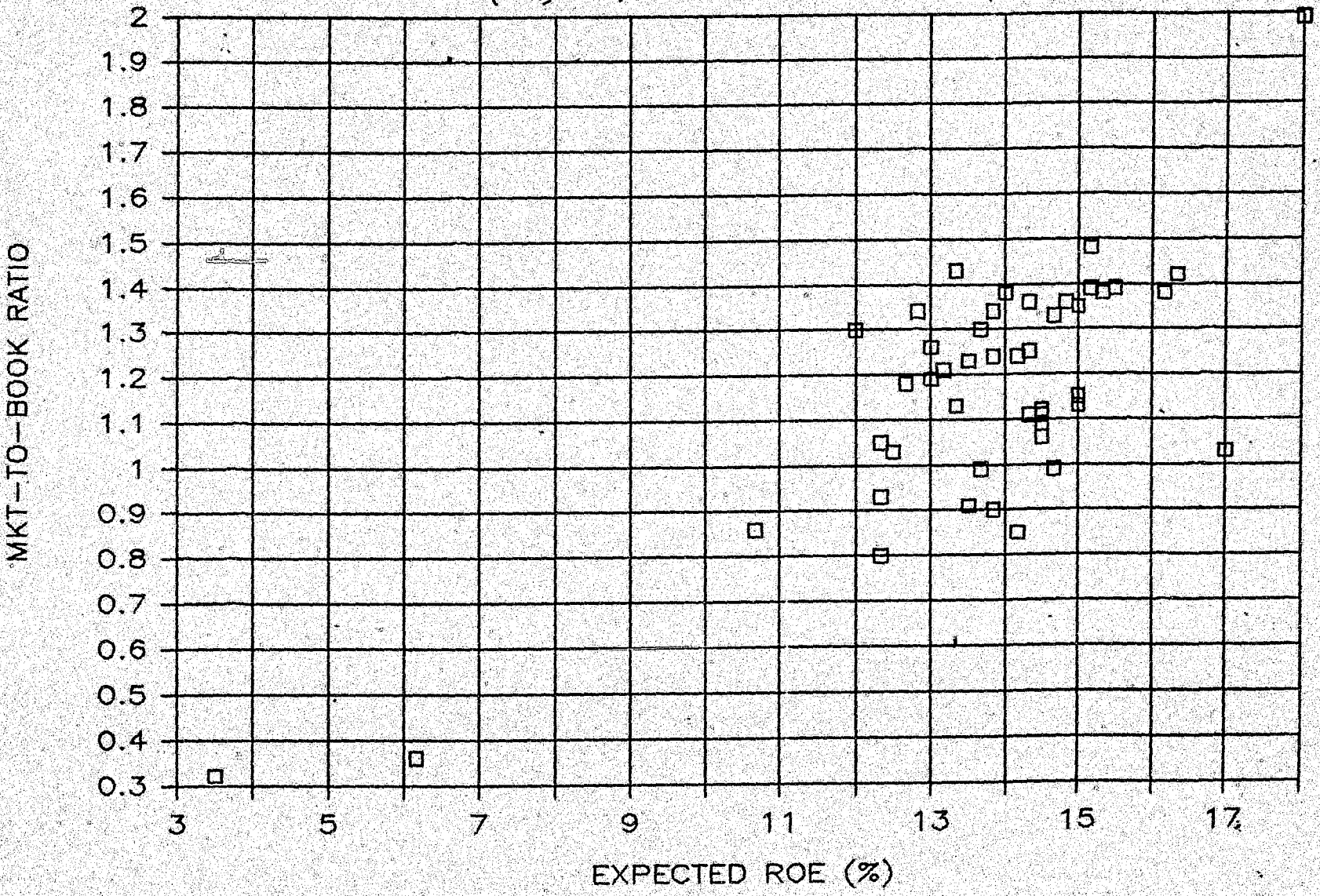
FOR 5-YEAR PERIODS 1929-1984



DOD Exhibit (FRW-9)

EXPECTED ROE VS MKT-TO-BOOK RATIOS

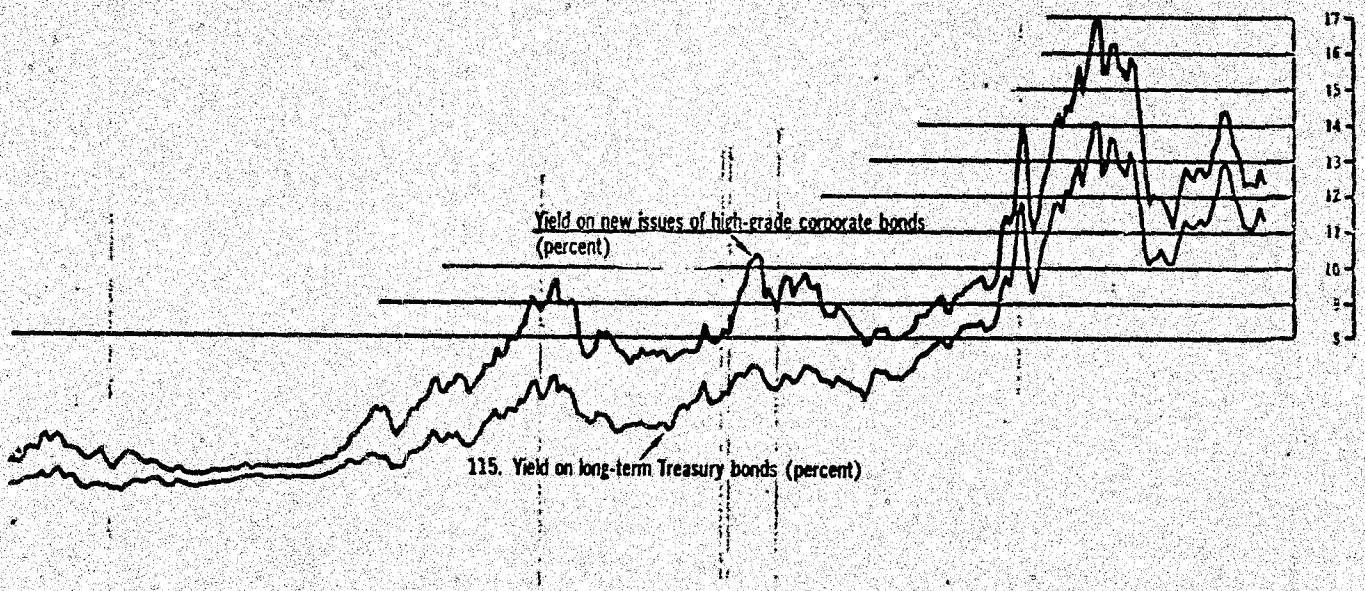
(July 26, 1985 Value Line Data)



DOD Exhibit (RRW-10)

COST OF CAPITAL TRENDS

1959 - 1984

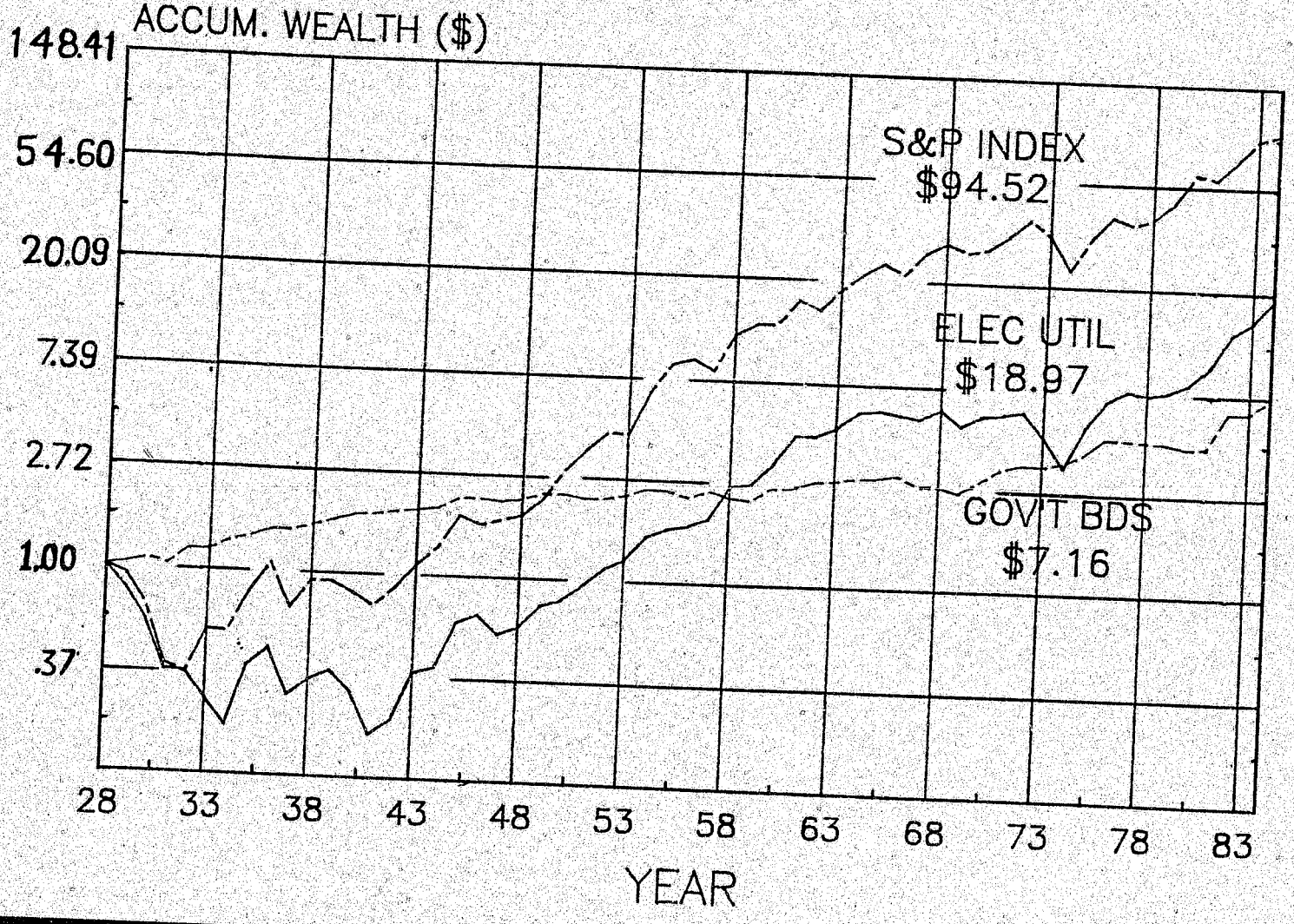


SOURCE: Business Conditions Digest, April, 1985

MAJOR INVESTMENT FIRMS' RECENT SHORT-TERM GROWTH EXPECTIONS FOR EPE DIVIDENDS AND EARNINGS

	Expected Average Annual Growth Rates (%)	
	Dividends	Earnings
Value Line	6.3	5.3
Prudential-Bache	4.0	3.0
Merrill Lynch	4.7	2.7
Salomon Brothers	5.0	5.0
Duff and Phelps	-	0 to 6.0
Dean Witter	5.0	5.0
Average	5.0%	4.2 to 4.5%

ACCUMULATED WEALTH FROM $1.00 INVESTED AT THE BEGINNING OF 1929



DOD Exhibit (PRW-13)

DOD EXHIBIT (PRW-14)

COVERAGE RATIOS ASSOCIATED WITH PROPOSED CAPITAL STRUCTURE

DOD recommended capital structure and costs of capital:

DOD proposal: 36.79% equity; 52.60% long-term debt; 10.61% preferred stock; 10.82% cost of L.T. debt; 14.85% cost of equity; 9.80% cost of preferred stock

$$\text{Coverage Ratio} = \frac{(.1082)(.526)+((.098)(.1061)+(.1485)(.3679))/.5}{(.1082)(.526)}$$

$$= .1951/.0650 = 3.0$$

FRANCIS B. HAAS, JR.
G. THOMAS MILLER
DONALD R. WAISEL
RICHARD R. LEFEVER
J. THOMAS MENAKER
CLYDE W. McINTYRE
S. BERNE SMITH
ROD J. PERA
EDWARD W. ROTHMAN
ROBERT A. MILLS
W. JEFFRY JAMOUNEAU
HERBERT R. NURICK
DAVID E. LEHMAN
NORMAN I. WHITE
F. MURRAY BRYAN
RICHARD W. STEVENSON
WILLIAM A. CHESNUTT
HENRY R. MacNICHOLAS
WILLIAM M. YOUNG, JR.
ROBERT M. CHERRY

JOHN S. OYLER
DELANO M. LANTZ
HARVEY FREEDENBERG
EDWARD J. RIEHL
JASON S. SHAPIRO
ERIC L. BROSSMAN
ROBERT D. STETS
TERRY R. BOSSERT
MARY JANE FORBES
JEFFREY B. CLAY
DAVID M. KLEPPINGER
NEAL S. WEST
JESSIE L. SMITH
BRUCE A. FELDMAN
FRANKLIN A. MILES, JR.
MICHAEL A. DOCTROW
MICHAEL G. JARMAN
STEPHEN A. MOORE
DANA S. SCADUTO
BARBARA S. KAHOE

100 PINE STREET
P. O. BOX 1166
HARRISBURG, PA. 17108-1166
TELEPHONE (717) 232-8000

RETIRED PARTNERS

HARRY H. FRANK
JAMES H. BOOSER
JAMES W. HAGAR
JAMES H. KING

OF COUNSEL

GILBERT NURICK
SAMUEL A. SCHRECKENGAUST, JR.
JEFFERSON C. BARNHART

January 13, 1986

Re: Pennsylvania Public Utility Commission, et al.,
v. Philadelphia Electric Company
Docket No. R-850152

RECEIVED
JAN 13 1986
SECRETARY'S OFFICE
Public Utility Commission

William E. Zeiter, Esquire
Counsel for Philadelphia Electric Company
Morgan, Lewis & Bockius
2000 One Logan Square
Philadelphia, PA 19103

Dear Mr. Zeiter:

Enclosed please find the original and one (1) copy of the responses by Philadelphia Area Industrial Energy Users Group to Interrogatories and Requests for Production of Documents and Data of the Philadelphia Electric Company, Set I pursuant to your letter request of December 23, 1985.

All parties of record to this proceeding have been provided with copies of the enclosed.

Very truly yours,

McNEES, WALLACE & NURICK

DOCUMENT FOLDER

By David M. Kleppinger
David M. Kleppinger

DMK/jf
Enclosures

HAND DELIVERED

cc: All Parties of Record (w/encl.)

JAN 13 1986
SECRETARY'S OFFICE
Public Utility Commission

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

PENNSYLVANIA PUBLIC UTILITY COMMISSION, et al.,	:	
v.	:	Docket No. R-850152
PHILADELPHIA ELECTRIC COMPANY	:	

RESPONSE OF PHILADELPHIA AREA INDUSTRIAL ENERGY USERS GROUP TO INTERROGATORIES AND REQUESTS FOR PRODUCTION OF DOCUMENTS AND DATA OF THE PHILADELPHIA ELECTRIC COMPANY

SET I

DOCKETED
JAN 14 1986

DOCUMENT FOLDER

PECo-PAIEUG-1-1: State the name, educational background and professional credentials of each person from Kennedy and Associates and Drazen-Brubaker & Associates, Inc. and all other persons you expect to call as an expert witness in this proceeding.

RESPONSE: Kennedy and Associates - Randall J. Falkenberg. (See, attachment IR-PECo-PAIEUG-1-1(a).

Drazen-Brubaker & Associates, Inc. - Jeffry Pollock (See, attachment IR-PECo-PAIEUG-1-1(b));Melvin P. Bloom (See, attachment IR-PECo-PAIEUG-1-1(c))

PHILADELPHIA ELECTRIC COMPANY

DOCKET NO. R-850152 (LIMERICK 1)

TESTIMONY OF RANDALL J. FALKENBERG

Q. Please state your name and business address.

A. Randall J. Falkenberg, Suite A-1220, 1150 Hammond Drive, Atlanta, Georgia 30328.

Q. What is your occupation and by whom are you employed

A. I am a utility rate and planning consultant holding the position of Vice President and Principal with the firm Kennedy and Associates.

Q. Please summarize your educational background.

A. I received my Bachelor of Science degree with Honors in Physics and a minor in mathematics from Indiana University. I received a Master of Science degree in Physics from the University of Minnesota. My thesis research was in nuclear theory. At Minnesota I also did graduate work in engineering economics and econometrics.

Q. Please summarize your professional experience and qualifications.

A. After graduating from the University of Minnesota in 1977, I was employed by Minnesota Power as a Rate Engineer. I designed and coordinated the Company's first load research program. I also performed load studies used in

cost-of-service studies and assisted in rate design activities.

In 1978, I accepted the position of Research Analyst in the Marketing and Rates department of Puget Sound Power and Light Company. In that position I prepared the two year sales and revenue forecasts used in the Company's budgeting activities and developed methods to perform both near and long-term load forecasting studies.

In 1979, I accepted the position of Consultant in the Utility Rate Department of Ebasco Service Inc. In 1980, I was promoted to Senior Consultant in the Energy Management Services Department. At Ebasco I performed and assisted in numerous studies in the areas of cost-of-service, load research and utility planning. In particular I was involved in studies concerning analysis of excess capacity, evaluation of the planning activities of a major utility on behalf of its public service commission, development of a methodology for computing avoided costs and cogeneration rates, long-term electricity price forecasts and cost allocation studies.

I was the principal author of production costing software used by 18 utility clients and public service commissions for evaluation of marginal costs, avoided costs and production costing analysis. I assisted over a dozen utilities in the performance of marginal and avoided cost studies related to the PURPA of 1978 and cogeneration rate design. In this capacity I worked with utility planners and rate specialists in quantifying the rate and cost impact

of generation expansion alternatives. This activity included estimating carrying costs, O&M expenses and capital cost estimates for future generation.

In 1982 I accepted the position of Senior Consultant with Energy Management Associates, Inc. and was promoted to Lead Consultant in June 1983. At EMA I trained and consulted with planners and financial analysts at several utilities in applications of the PROMOD and PROSCREEN planning models. I assisted planners in applications of these models to the preparation of studies evaluating the revenue requirements and financial impact of generation expansion alternatives, alternate load growth patterns, alternate regulatory treatments such as CWIP in rate base, and the phase-in of new baseload generation. I also assisted in EMA's educational seminars where we trained utility personnel in aspects of production cost modeling and other modern techniques of generation planning.

I became a Principal in Kennedy and Associates in 1984. Since then I have performed studies of future industrial electric rates and performed analyses of the impact of alternate planning decisions on industrial consumers. I have testified before the regulatory commissions in Florida, Kentucky, Connecticut, Pennsylvania, North Carolina, Georgia and West Virginia as an expert witness on utility planning, addressing issues of CWIP in rate base, generation expansion alternatives, excess capacity and phase-in. In previous testimony I have testified that the Susquehanna and Millstone nuclear units, along with the Crystal River 5 coal unit were economically beneficial to

customers. I have testified regarding the economic and reliability advantages of alternatives in the Limerick 2 nuclear unit. Kennedy and Associates performed an independent investigation for the Georgia Public Service Commission regarding Georgia Power Company's Construction Program. In that study, we recommended completion of GPC's Vogtle nuclear plants and the Scherer coal units. We recommended cancellation of the Rocky Mountain pumped storage unit.

Also, in June of 1984, I was asked to speak before the Mid-America Regulatory Commissioners' convention on the topic "Nuclear Rate Shock - Is Phase-In the Answer"

Qualifications of Jeffry Pollock

Q Please state your name and business address.

A Jeffry Pollock, 605 Old Ballas Road, St. Louis, Missouri.

Q What is your occupation?

A I am a consultant in the field of public utility regulation and am employed by Drazen-Brubaker & Associates, Inc., utility rate and economic consultants.

Q Please state your educational background and experience.

A I am a graduate of Washington University. I hold the degrees of Bachelor of Science in Electrical Engineering and Master of Business Administration. At various times prior to graduation, I worked for the McDonnell Douglas Corporation in the Corporate Planning Department; Sachs Electric Company; and L. K. Comstock & Company. While at McDonnell Douglas, I analyzed the direct operating cost of commercial aircraft. Upon graduation, in June, 1975, I joined the firm of Drazen-Brubaker & Associates, Inc. My work consists of preparation of financial and economic studies relating to electric and gas utilities, including revenue requirements, cost-of-service studies, rate design, and contract analysis.

I have testified before the regulatory commissions of Alabama, Delaware, Florida, Georgia, Illinois, Louisiana, Minnesota, Missouri, Montana, New Mexico, Ohio, Pennsylvania, Texas and Washington. I have also appeared before the Board of Public Utilities of

Kansas City, Kansas, and before the Bonneville Power Administration.

The firm of Drazen-Brubaker & Associates, Inc. was incorporated in 1972 and has assumed the utility rate and economic consulting activities of Drazen Associates, Inc., active since 1937. In the last five years, our firm has participated in more than 450 rate cases in thirty-eight states.

The firm provides consulting services in the field of public utility regulation to many clients, including large industrial and institutional customers, some utilities and, on occasion, state regulatory agencies. In addition, we have also prepared depreciation and feasibility studies relating to utility service. In all these cases, it was necessary to analyze the utility's operating and financial records, including property records, depreciation studies, revenues, expenses and taxes. We also assist in the negotiation of contracts for utility service for large users.

In general, we are engaged in regulatory consulting, economic studies and contract negotiation.

Qualifications of Melvin P. Bloom

Q PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A Melvin Bloom, 1801 N. Front Street, Harrisburg, Pennsylvania.

Q BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A I am a consultant in the field of public utility regulation and am employed by Drazen-Brubaker & Associates, Inc., utility rate and economic consultants.

Q WILL YOU STATE BRIEFLY YOUR EDUCATIONAL BACKGROUND AND EXPERIENCE?

A I am a graduate of the Pennsylvania State University, with the degrees of Bachelor of Science in Electric Engineering, Master of Science in Electrical Engineering, and Doctor of Philosophy in Electrical Engineering--with a minor in Applied Mathematics. From 1963 through 1969 I taught courses in Physics, Electric Engineering at the Pennsylvania State University. From 1970 through 1975, I was Supervisor of the Engineering Section of the Environmental Test Laboratory of AMP, Inc. From 1975 through 1980, while employed as an Engineer in the Bureau of Rates of the Pennsylvania Public Utility Commission, I actively participated and testified in nearly all major electric rate cases regarding the subject of cost of service and rate design. In addition, I authored both the preliminary and final Pennsylvania Generic Electric Rate Structure Investigation Report in Docket No. 76-PRMD-7. From 1970 through 1979, I taught

courses in Mathematics and Electrical Engineering for the Pennsylvania State University and the Lebanon Valley College. In May of 1980, I joined the firm of Drazen-Brubaker & Associates, Inc. My work consists of preparation of financial and economic studies relating to electrical and gas utilities, including determination of cost of service and rate design. I have also testified before the Arizona Corporation Commission, Massachusetts Department of Public Utilities, New Jersey Board of Public Utilities, and the New Mexico Public Service Commission.

The firm of Drazen-Brubaker & Associates, Inc. was incorporated in 1972 and has assumed the utility rate and economic consulting activities of Drazen Associates, In., that was active in that field since 1937. In the last five years our firm has participated in more than 700 rate cases in forty states.

The firm provides consulting services in the field of public utility regulation to many clients, including large industrial customers, schools, hospitals, some utilities and, on occasion, state regulatory agencies. For regulatory proceedings, we regularly prepare studies relating the revenue requirements and rate design. We also prepare depreciation and feasibility studies relating to utility service. In making these studies, it is necessary to analyze utilities' operating and financial records, including property records, depreciation studies, revenues, expenses and taxes, cost studies, load studies, forecasts and siting studies. We also assist in the negotiation of contracts for utility service for large users.

In general, we are engaged in regulatory consulting, rate work, feasibility, economic and cost-of-service studies, design of rates for utility services and contract negotiations.

PECo-PAIEUG-1-2: State the subject matter on which each expected witness identified in response to Interrogatory 1, above, is expected to testify.

RESPONSE:

(a) Randall J. Falkenberg will testify concerning the phase-in of the proposed base rate increase the appropriate portion of common plant to be included in rate base, the appropriate depreciation methodology for Limerick Unit No. I, and general regulatory principles regarding excess capacity and proper rate treatment for Limerick Unit No. I.

(b) Jeffry Pollock will testify regarding the appropriate distribution of the rate increase among customer classes and the appropriate cost-of-service study to utilize in determining the distribution of the increase among customer classes.

(c) Melvin P. Bloom will testify concerning the internal rate design of Rate HT and its relationship to the cost-of-service study methodology.

PECo-PAIEUG-1-3: For each expected witness identified in response to Interrogatory 1, above, provide:

(a) A listing of all prior proceedings in which the witness offered testimony or a report on, or related to, any of the subjects on which the witness is epxected to testify. Include the date, location, party represented and docket number for each prior proceeding, and provide copies of all testimony or reports.

(b) Any study, article or other document authored or coauthored by such witness on any of the subjects on which the witness is expected to testify.

RESPONSE:

(a) A listing of the proceedings in which Randall J. Falkenberg has previously testified will be included in the workpapers accompanying his direct testimony. Copies of all testimony produced by Randall J. Falkenberg are extremely voluminous and can be reviewed at the offices of Kennedy and Associates located at 1150 Hammond Drive, Suite A-1220, Atlanta, GA 30328.

Attachments IR-PECo-PAIEUG-1-3(a) provides for the appearances and proceedings in which Jeffry Pollock and Melvin P. Bloom have testified. Again, the copies of testimony produced during these proceedings is extremely voluminous and can be reviewed at the offices of Drazen-Brubaker & Associates, Inc. located at 605 Old Ballas Road, St. Louis, MO 63141-0110.

(b) See response to IR-PECo-PAIEUG-1-3(a).

DRAZEN-BRUBAKER & ASSOCIATES, INC.
Appearances in Rate Proceedings
by Jeffry Pollock

COMPANY	STATE	DOCKET	DATE	SUBJECTS PRESENTED
Union Electric Co. (Rebuttal)	Missouri	EO-78-163	Apr. 1979	Cost of Service
Union Electric Co.	Missouri	EO-78-163	Nov. 1978	Cost of Service
Citizens Electric Corp.	Missouri	18,579 & 18,656	Feb. 1976	Financial and Statistical Data
Central Illinois Public Service Co.	Illinois	76-0304	Nov. 1976	Cost Analysis
Florida Power & Light Co.	Florida	760727-EU	Feb. 1977	Rate Analysis
Union Electric Co.	Missouri	ER-77-154	Sept. 1977	Cost of Service
Union Electric Co.	Illinois	77-0198	Aug. 1977	Cost of Service
Citizens Electric Corp.	Missouri	ER-78-196 et al	Oct. 1978	Fuel Adjustment
Georgia Power Co.	Georgia	3002-U	June 1977	Cost of Service
Central Illinois Public Service Co.	Illinois	77-0375	Nov. 1977	Cost of Service
Minnesota Power & Light Co.	Minnesota	E015/GR-77-360	Sept. 1977	Cost of Service

COMPANY	STATE	DOCKET	DATE	SUBJECTS PRESENTED
Montana Light & Power Co.	Montana	6551	Jan. 1978	Revenue Requirement, Operating Data, Cost of Service, Rate Design, Jurisdictional Allocation, Rate Analysis, Cost of Capital, Rate Struct.
Philadelphia Electric Co.	Pennsylvania	R.I.D. 438	Apr. 1978	Cost of Service
Gulf Power Co.	Florida	770872-EU	Apr. 1978	Cost of Service
Laclede Gas Co.	Missouri	GR-78-148	July 1978	Cost of Service, Rate Analysis
Gulf States Utilities Co.	Texas	1528	Mar. 1978	Cost of Service
Delmarva Power & Light Co.	Delaware	923	July 1978	Cost of Service
Houston Lighting & Power Co.	Texas	2001	Sept. 1978	Cost of Service
Citizens Electric Corp. (Supplemental)	Missouri	ER-80-24	Apr. 1980	Revenue Requirement
Citizens Electric Corp.	Missouri	ER-79-102	Dec. 1978	Revenue Requirement
Citizens Electric Corp.	Missouri	ER-80-24	Dec. 1979	Cost of Service, Rate Design, Revenue Requirement

COMPANY	STATE	DOCKET	DATE	SUBJECTS PRESENTED
Montana Light & Power Co.	Montana	6664	May 1979	Revenue Requirement, Operating Data, Cost of Service, Rate Design, Jurisdictional Allocation, Rate Analysis, Rate Struct., Cost of Capital
Georgia Power Co.	Georgia	3129-U	July 1979	Cost of Service, Revenue Allocation
Alabama Power Co.	Alabama	17667	May 1979	Rate Design
Central Illinois Public Service Co.	Illinois	79-0087	July 1979	Cost of Service
Kit Carson Electric Co-operative, Inc.	New Mexico	1627	May 1981	Cost of Service, Rate Design, Revenue Requirement
Houston Lighting & Power Co.	Texas	2959	Mar. 1980	Cost of Service--Franchise Fees
Houston Lighting & Power Co.	Texas	2676	Sept. 1979	Cost of Service
Florida Public Service Commission	Florida	790571-EU(SC)	Dec. 1979	Cost of Service, Rate Design
El Paso Electric Co.	Texas	2641	Aug. 1979	Cost of Service, Rate Design
Union Electric Co.	Missouri	ER-80-17	Feb. 1980	Cost of Service
Gulf States Utilities Co.	Texas	2677	Sept. 1979	Cost of Service

COMPANY	STATE	DOCKET	DATE	SUBJECTS PRESENTED
Philadelphia Electric Co.	Pennsylvania	R-79060865	Nov. 1979	Revenue Allocation, Cost of Service
Central Power and Light Co.	Texas	2840	Nov. 1979	Cost of Service
Board of Public Utilities of Kansas City, Kansas (PURPA)	Kansas	80-01	Aug. 1980	Lifeline Rates, Automatic Adjustment Clauses
Illinois Commerce Commission (PURPA)	Illinois	80-0660	Oct. 1982	Lifeline Rates
Texas Power & Light Co.	Texas	3006	Mar. 1980	Cost of Service, Rate Design
Alabama Power Co.	Alabama	17859	May 1980	Cost of Service, Rate Design, Revenue Allocation
Alabama Power Company(Supplemental)	Alabama	17859 & 17667	May 1980	Revenue Allocation
Gulf States Utilities Co.	Louisiana	U-14495	Feb. 1980	Cost of Service, Revenue Allocation
Gulf States Utilities Co. (PURPA)	Louisiana	U-14495	Sept. 1980	Cost-of-Service Analysis, Justification of Rate Level Differentials
Tampa Electric Co.	Florida	800011-EU	July 1980	Cost of Service, Justification of Rate Level Differentials

COMPANY	STATE	DOCKET	DATE	SUBJECTS PRESENTED
Minnesota Power & Light Co. (Rebuttal)	Minnesota	E015/GR-80-76	Aug. 1980	Cost of Service
Minnesota Power & Light Co. (Surrebuttal)	Minnesota	E015/GR-80-76	Aug. 1980	Cost of Service
Minnesota Power & Light Co.	Minnesota	E015/GR-80-76	July 1980	Cost of Service, Rate Design, Revenue Allocation, Justification of Rate Level Differentials
Central Illinois Public Service Co. (PURPA)	Illinois	80-0124	Aug. 1981	Cost of Service
Georgia Public Service Commission (PURPA)	Georgia	3210-U	June 1980	Cost of Service
Citizens Electric Corp.	Missouri	ER-81-79	Dec. 1980	Cost of Service, Rate Design, Revenue Requirement
Citizens Electric Corp. (Supplemental)	Missouri	ER-81-79	Feb. 1981	Revenue Requirement
Citizens Electric Corp. (Rebuttal)	Missouri	ER-81-79	May 1981	Revenue Requirement
Citizens Electric Corp.	Missouri	ER-81-78	Sept. 1980	Revenue Requirement, Rate Design Cost of Service
Central Illinois Public Service Co.	Illinois	80-0318	Oct. 1980	Cost of Service

COMPANY	STATE	DOCKET	DATE	SUBJECTS PRESENTED
Texas Electric Service Co.	Texas	3250	July 1980	Revenue Allocation, Rate Design, Justification of Rate Level Differentials
Union Electric Company (Supplemental)	Illinois	80-0370 80-0368	Dec. 1980	Cost of Service
Union Electric Company	Illinois	80-0370 80-0368	Nov. 1980	Cost of Service
Gulf States Utilities Co.	Texas	3298	Aug. 1980	Cost of Service Analysis
El Paso Electric Co.	Texas	3254	July 1980	Cost of Service, Rate Design, Revenue Allocation, Justification of Rate Level Differentials
Houston Lighting & Power Co.	Texas	3320	Sept. 1980	Cost of Service Analysis
Philadelphia Electric Co.	Pennsylvania	R-80061225	Nov. 1980	Cost of Service
Bonneville Power Administration	Oregon	--	Apr. 1981	Cost of Service
Public Utility Commission of Texas (PURPA)	Texas	3437	Feb. 1981	Catalog of Load Characteristics of the major Texas elec. util.
Texas Generic (PURPA)	Texas	3437	Jan. 1981	Demand Allocation Methods

COMPANY	STATE	DOCKET	DATE	SUBJECTS PRESENTED
The Cincinnati Gas & Electric Co.	Ohio	81-66-EL-AIR 81-756-EL-AIR	Nov. 1981	Cost of Service
Southwestern Electric Power Co.	Texas	3716	Apr. 1981	Cost of Service
Alabama Power Co.	Alabama	18117	Aug. 1981	Cost of Service, Justification of Rate Level Differentials
Board of Public Utilities of Kansas City, Kansas	Kansas	1981	June 1981	Cost of Service, Rate Design
Georgia Power Co.	Georgia	3270-U	Aug. 1981	Cost of Service, Rate Design
Gulf Power Co. (Supplemental)	Florida	810136-EU	May 1982	Cost of Service
Gulf Power Co.	Florida	810136-EU	Nov. 1981	Cost of Service
Houston Lighting & Power Co.	Texas	4089	Feb. 1982	Cost of Service
Houston Lighting & Power Co.	Texas	3955	Sept. 1981	Cost of Service
Puget Sound Power & Light Co.	Washington	U-81-41	Nov. 1981	Revenue Requirement
Philadelphia Electric Co.	Pennsylvania	R-811626	Nov. 1981	Cost of Service

COMPANY	STATE	DOCKET	DATE	SUBJECTS PRESENTED
Central Illinois Light Co.	Illinois	81-0600	Feb. 1982	Cost of Service
Gulf States Utilities Co.	Louisiana	U-15271	July 1982	Cost of Service, CWIP
Gulf States Utilities Co. (Interim)	Louisiana	U-15271	May 1982	Cost of Service, Rate Design
Montana Light & Power Co.	Montana	82.4.22	Apr. 1982	Cost of Service, Rate Design Revenue Requirement
Central Illinois Public Service Co. (Rebuttal)	Illinois	82-0039	July 1982	Cost of Service, Rate Design
Central Illinois Public Service Co.	Illinois	82-0039	June 1982	Cost of Service, Rate Design
Board of Public Utilities of Kansas City, Kansas (PURPA)	Kansas	--	Oct. 1982	Cost of Service
Central Power and Light Co.	Texas	4400	May 1982	Cost of Service, CWIP
Citizens Electric Corp. (Interim)	Missouri	ER-83-109	Dec. 1982	Justification for Revenue Increase, Revenue Allocation
Citizens Electric Corp. (Supplemental)	Missouri	ER-83-61	Feb. 1983	Cost of Service, Rate Design, Revenue Requirement

COMPANY	STATE	DOCKET	DATE	SUBJECTS PRESENTED
Citizens Electric Corp.	Missouri	ER-83-61	Nov. 1982	Cost of Service, Rate Design, Revenue Requirement
The Cincinnati Gas & Electric Co.	Ohio	82-485-EL-AIR	Jan. 1983	Rate Design, Revenue Allocation
Tampa Electric Co.	Florida	820007-EU	July 1982	CWIP
Florida Power & Light Co.	Florida	820097-EU	Aug. 1982	Cost of Service
Gulf States Utilities Co.	Texas	4510	July 1982	Cost Allocation
Florida Power & Light Co.	Florida	820001-EU	Aug. 1982	Cost of Service, Rate Design
Houston Lighting & Power Co.	Texas	4540	Aug. 1982	Cost of Service
Gulf Power Co.	Florida	820150-EU	Sept. 1982	Cost of Service, Rate Design
Gulf Power Co. (Supplemental)	Florida	820150-EU	Sept. 1982	Cost of Service
El Paso Electric Co.	Texas	4620	Sept. 1982	Cost of Service, Rate Design
El Paso Electric Co.	New Mexico	1755--Phase II	Nov. 1982	Cost of Service, Rate Design
Southwestern Electric Power Co.	Texas	4628	Sept. 1982	Cost of Service

COMPANY	STATE	DOCKET	DATE	SUBJECTS PRESENTED
Union Electric Co.	Illinois	82-0525	Dec. 1982	Rate Design, Revenue Allocation
Union Electric Co. (Rebuttal)	Illinois	82-0525	Feb. 1983	Cost of Service, Rate Design
Puget Sound Power & Light Co.	Washington	U-82-38	Apr. 1983	Revenue Requirement
Gulf States Utilities Co.	Louisiana	U-15641	Sept. 1983	Cost of Service, CWIP
Florida Power & Light Co. (Supplemental)	Florida	820097-EU	Mar. 1983	Cost of Service, Rate Design
Philadelphia Electric Company	Pennsylvania	R-822291	June 1983	Cost of Service
Georgia Power Company	Georgia	3397-U	July 1983	Cost of Service, Rate Design, Revenue Allocation
Tampa Electric Company	Florida	830012-EU	June 1983	CWIP
Tampa Electric Company	Florida	830012-EU	June 1983	CWIP
Houston Lighting & Power Co.	Texas	4802, 5050 & 5062	Sept. 1983	Cost of Service
Board of Public Utilities of Kansas City, Kansas	Kansas	83-1E	Aug. 1983	Cost of Service
Texas Electric Service Company	Texas	5200	Aug. 1983	Cost of Service

COMPANY	STATE	DOCKET	DATE	SUBJECTS PRESENTED
Southwestern Electric Power Co.	Texas	5301	Nov. 1983	Cost of Service
Kit Carson Electric Cooperative, Inc.	New Mexico	1865	May 1984	Cost of Service, Revenue Requirement
Central Illinois Light Co.	Illinois	83-0177	Sept. 1983	Plant Cancellation Costs
Gulf States Utilities Company	Texas	5560	Apr. 1984	Cost of Service, Rate Design
Houston Lighting & Power Co. (Interim)	Texas	5779	July, 1984	Interim Fuel Refund
Houston Lighting & Power Co.	Texas	5779	Sept. 1984	Cost of Service
IBM Seminar	Missouri	--	Feb. 1984	Revenue Requirement
Florida Power & Light Company	Florida	830465-EI	Mar. 1984	Cost of Service
Florida Power & Light Company (Supplemental)	Florida	830465-EI	Mar. 1984	Cost of Service
The Cincinnati Gas & Electric Co.	Ohio	83-1528-AL-AIR	Aug. 1984	Cost of Service, Rate Design
Philadelphia Electric Company	Pennsylvania	P-830453	Apr. 1984	Fuel Costs

COMPANY	STATE	DOCKET	DATE	SUBJECTS PRESENTED
Philadelphia Electric Company	Pennsylvania	R-842590	Aug. 1984	Cost of Service, Rate Design
Philadelphia Electric Company (Rebuttal)	Pennsylvania	R-842590	Sept. 1984	Cost of Service
Union Electric Company (Supplemental)	Illinois	84-0109	Dec. 1984	Phase-In
Union Electric Company (Rebuttal)	Illinois	84-0109	Nov. 1984	Cost of Service, Rate Design
Union Electric Company (Surrebuttal)	Illinois	84-0109	Nov. 1984	Cost of Service, Rate Design
Union Electric Company	Illinois	84-0109	Sept. 1984	Cost of Service, Rate Design
Texas Utilities Electric Co.	Texas	5640	July 1984	Cost of Service, Rate Design, Revenue Allocation
El Paso Electric Company	Texas	5700	July 1984	Cost of Service, Rate Design
Gulf Power Company	Florida	840086-EI	Aug. 1984	Cost of Service, Rate Design

COMPANY	STATE	DOCKET	DATE	SUBJECTS PRESENTED
Columbus Electric Cooperative, Inc. (Surrebuttal)	New Mexico	1874	July 1984	Cost of Service, Revenue Requirement
Columbus Electric Cooperative, Inc.	New Mexico	1874	June 1984	Cost of Service, Revenue Requirement
Plains Electric Generation and Transmission Cooperative, Inc.	New Mexico	1887	Oct. 1984	Rate Design, Revenue Requirement
Central Power and Light Co.	Texas	6032 & 6072	Feb. 1985	Interim Fuel Factor
Central Power and Light Co.	Texas	6032	Jan. 1985	Interim Fuel Factor
Florida Industrial Power Users Group (Seminar)	Florida	--	Feb. 1985	Cost of Service, Rate Design, Revenue Requirement
Atlantic City Electric Company	New Jersey	8310-883 (Phase II) PUC 7010-84	Apr. 1985	Cost of Service
Montana Light & Power Company	Montana	--	May 1985	Cost of Service, Rate Design, Revenue Deficiency, Rate Spread
New Jersey Industrial Energy Users' Association (Seminar)	New Jersey	--	May 1985	Rate-making

COMPANY	STATE	DOCKET	DATE	SUBJECTS PRESENTED
Tampa Electric Company	Florida	850050-EI	June 1985	Cost of Service
Rebuttal			July 1985	Cost of Service
Supplemental rebuttal			July 1985	Cost of Service
2nd Supplemental rebuttal			Aug. 1985	Cost of Service
Houston Lighting & Power Co.	Texas	5779	July 1985	Interim Fuel Refund
El Paso Electric Company	Texas	5700	July 1985	Cost of Service, Rate Design
Union Electric Company	Iowa	RPU-85-9	Aug. 1985	Rate Design, Phase-In
Atlantic City Electric Company	New Jersey	ER 8504434 (Phase I)	Oct. 1985	Cost of Service, Rate Design
El Paso Electric Company	Texas	6350	Oct. 1985	Phase-In, Cost of Service, Rate Design
Central Power and Light Co.	Texas	6375	Nov. 1985	Cost of Service, Rate Design
Southwestern Public Service Co.	Texas	6465	Nov. 1985	Cost of Service, Rate Design
Union Electric Company	Illinois	85-0006 (Re-opened)	Dec. 1985	Rate Design
El Paso Electric Company	New Mexico	1833 (Phase II)	Dec. 1985	Revenue Requirement, Cost of Service, Rate Design

Attachment IR-PECo-PAIEUG

DRAZEN-BRUBAKER & ASSOCIATES, INC.
Appearances in Rate Proceedings
by Melvin P. Bloom

OJ	COMPANY	STATE	DOCKET	DATE	SUBJECTS PRESENTED
92	Western Massachusetts Electric Co. (Surrebuttal)	Massachusetts	D.P.U. 20110	Dec. 1981	Cost of Service, Rate Design
92	Western Massachusetts Electric Co.	Massachusetts	20110	Sept. 1981	Cost of Service, Rate Design
29	Arizona Electric Power Cooperative, Inc.	Arizona	U-1773-81-285	Nov. 1981	Fuel Adjustment Clause
50	UGI Corp. (Gas Division) (Rebuttal)	Pennsylvania	R-821899	Aug. 1982	Cost of Service, Rate Design
50	UGI Corp. (Gas Division)	Pennsylvania	R-821899	July 1982	Cost of Service, Rate Design
56	Commonwealth Gas Co.	Massachusetts	D.P.U. 1120	July 1982	Cost of Service, Rate Design
52	Pennsylvania Power Company	Pennsylvania	R-832409	Nov. 1983	Cost of Service, Rate Design
72	The Peoples Natural Gas Company	Pennsylvania	R-832315	Aug. 1983	Cost of Service
73	UGI Corporation	Pennsylvania	R-832331	Aug. 1983	Cost of Service
08	Arizona Electric Power Cooperative, Inc.	Arizona	U-1773-83-196	Jan. 1984	Cost of Service

ROJ	COMPANY	STATE	DOCKET	DATE	SUBJECTS PRESENTED
676	Keystone Water Company	Pennsylvania	R-832511	Mar. 1984	Cost of Service
715	Jersey Central Power & Light Co.	New Jersey	841-55	June 1984	Cost of Service, Rate Design
750	Plains Electric Generation and Transmission Cooperative, Inc.	New Mexico	1887	Oct. 1984	Cost of Service
61	Duquesne Light Company	Pennsylvania	R-842583, etc.	Sept. 1984	Cost of Service
10	Pennsylvania Power & Light Company (Surrebuttal)	Pennsylvania	R-842651	Dec. 1984	Rate Design
32	Pennsylvania Power Company	Pennsylvania	R-842740	Feb. 1985	Cost of Service, Rate Design
1	West Penn Power Company (Rebuttal)	Pennsylvania	R-842632	Mar. 1985 Apr. 1985	Cost of Service, Rate Design Rate Design
1	Pennsylvania Electric Company (Rebuttal)	Pennsylvania	R-842771	May 1985 June 1985	Cost of Service, Rate Design Cost of Service, Rate Design
5	Monongahela Power Company	West Virginia	84-768-E-42T	June 1985	Cost of Service, Rate Design

)J	COMPANY	STATE	DOCKET	DATE	SUBJECTS PRESENTED
)8	Pennsylvania Gas and Water Co.	Pennsylvania	R-832315, F.010, etc.	June 1985	Transportation Rates
55	Duquesne Light Company (Supplemental)	Pennsylvania	R-850021	Aug. 1985	Revenue Requirement
				Aug. 1985	Cost of Service, Rate Design, Revenue Requirement
	(Rebuttal)			Sept. 1985	Cost of Service
	(Surrebuttal)			Oct. 1985	Cost of Service, Rate Design
)9	Equitable Gas Company	Pennsylvania	C-850163	Sept. 1985	Transportation Rates
)1	Jersey Central Power & Light Co.	New Jersey	ER-8507698	Dec. 1985	Cost of Service, Rate Design

PECo-PAIEUG-1-4: Identify and provide copies of any and all documents whatsoever which each witness identified in response to Interrogatory 1, above, relied upon or considered in reaching any qualitative or quantitative judgments or conclusions contained in his or her testimony or which was or will be used as a basis for other PAIEUG testimony.

RESPONSE: No documents were identified in response to Interrogatory IR-PECo-PAIEUG-1-1. A further response to this interrogatory is premature in that the testimony of PAIEUG witnesses has not yet been finalized.

PECo-PAIEUG-1-5: Identify and describe in detail all computational models - including especially Limerick or nuclear project generic cost and schedule models, regression analyses and any other quantitative or statistical models or analyses which each witness identified in response to Interrogatory 1, above, will use or used or considered for use in connection with the preparation of your case, whether or not such models and analyses will be presented as evidence.

RESPONSE: No computational models or any other quantitative or statistical models or analyses were identified in Interrogatory IR-PECo-PAIEUG-1-1. Any such models will be included in the workpapers accompanying Mr. Falkenberg's testimony, but PAIEUG will not provide any models or analyses which have not been included in Mr. Falkenberg's direct testimony.

PECo-PAIEUG-1-6: Provide the basic logic, statistical equation(s) and data base(s) for each model and analysis identified in response to Interrogatory 5, above. Logic and data bases should specifically include all activities and related durations, manhours, quantities, costs, dollars and all other relevant measures used to describe or quantify events and activities, and should be provided in the following formats:

(a) Hardcopy logic diagram(s) including all nodes and activities;
(b) Hardcopy tabular listing(s);
(c) Magnetic media such as, but not limited to, floppy discs or tape;
(d) Any other machine readable or hard copy format available.

RESPONSE: A detailed response to this Interrogatory is premature given the fact that PAIEUG's testimony has not been finalized. Workpapers accompanying the direct testimony of Mr. Falkenberg should be adequate to satisfy PECo's request in this Interrogatory.

PECo-PAIEUG-1-7: For each model and analysis identified in response to Question 5, above, state:

(a) When the model or analysis was developed;
(b) Who developed the model or analysis and, if developed by the expert or his or her organization or employer, provide copies of all workpapers or other source documents relied upon in developing that model or analysis;
(c) Whether the model or analysis is computerized and, if so, describe the software used, including, but not limited to, the language utilized, size in terms of linear code and computer memory, type of machine currently utilized to operate the model or perform the analysis, any commercial name or other applicable label, and any other information or data required to completely and accurately identify the software utilized;
(d) Whether the model or analysis has been used in the preparation of testimony, exhibits, studies or reports in any other proceeding and, if so, state the date, location and relevant docket number for each such proceeding, and identify the responsible party and witness(es);
(e) Whether the model or analysis is generic in nature or has been developed from Limerick-specific data.

RESPONSE: Please see response to IR-PECo-PAIEUG-1-6.

PECo-PAIEUG-1-8: To the extent not included in response to a prior Interrogatory, provide for each model or analysis identified in response to Interrogatory 5, above:

(a) The applicable user's guide and documentation;
(b) All inputs used, including computer commands;
(c) All outputs derived therefrom;
(d) The model code; and
(e) All other relevant information and data needed to fully understand and operate the model or perform analyses through its use.

RESPONSE: Please see response to IR-PECo-PAIEUG-1-6.

PECo-PAIEUG-1-9: For each model and analysis identified in response to Question 5, above, identify all modifications or adjustments made to account for Limerick-specific events, activities or factors, and describe in detail the specific changes.

RESPONSE: Please see response to IR-PECo-PAIEUG-1-6.