Columbia Exhibit No. _____

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the matter of:	)
	)
APPLICATION OF COLUMBIA GAS	) Case No. 2016-00162
OF KENTUCKY, INC. FOR AN	)
ADJUSTMENT OF RATES	)

PREPARED REBUTTAL TESTIMONY OF
PAUL R. MOUL
ON BEHALF OF COLUMBIA GAS OF KENTUCKY, INC.

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COLUMBIA GAS OF KENTUCKY, INC.

October 21, 2016

1 PREPARED REBUTTAL TESTIMONY OF PAUL R. MOUL

2 Q: Please state your name, occupation and business address.

3 A: My name is Paul Ronald Moul. My business address is 251 Hopkins Road,

4   Haddonfield, New Jersey 08033-3062. I am Managing Consultant at the firm

5   P. Moul & Associates, an independent financial and regulatory consulting

6   firm.

7

8 Q: Did you file Direct Prepared Testimony in this proceeding?

9 A: Yes, I did.

10

11 Q: What is the purpose of your Rebuttal Testimony in this proceeding?

12 A: My testimony responds to the direct testimony submitted by Richard A.

13   Baudino and Lane Kollen, witnesses appearing on behalf of the Attorney

14   General. If I fail to address each and every issue in the testimony of Messrs.

15   Baudino and Kollen, it does not imply agreement with those issues. I have

16   also prepared an update of my original analysis of the Company's cost of

17   equity.

18

19 Q: What are the key rate of return issues that the Commission should consider

20   when deciding this case?

1   A: Mr. Kollen has challenged the Company's actual capital structure ratios and

2   has proposed an alternative hypothetical capital structure. In addition, Mr.

3   Baudino has disputed the Company's cost of short-term debt and the rate of

4   return on common equity. There are two key factors that bear on the cost of

5   equity issue in this case. Aside from technical issues that I will discuss later in

6   my rebuttal testimony, the Commission should take into consideration the

7   following:

8   1)   A rate of return that will be reflective of capital cost rates, in the context

9   of an expected increase in interest rates.

10   2)   A rate of return that will reflect and be supportive of the Company's

11   financial and risk profile.

12   As I explain below, the recommendation of the AG fails to adequately consider

13   these two points and thereby significantly understate the cost of common

14   equity in this proceeding. The AG recommendation also fails to provide

15   adequate support for the Company's financial profile due to the unreasonably

16   low cost of equity, cost of short-term debt, and capital structure ratios that are

17   not appropriate for CKY and would materially increase its risk and cost of

18   capital.

19

20   **Q:**   **What explains the substantial disparity between the AG recommendation**

1		and your proposed 11.00% equity return?
2	A:	Mr. Baudino has understated the cost of equity for Columbia, which if adopted
3		by the Commission, would be of serious concern to investors in the financial
4		community. The difference between Columbia's cost of equity and the
5		proposal by the AG is attributable to a number of factors, including: (i) the
6		determination of a reasonable Discounted Cash Flow (DCF) return; (ii)
7		whether a leverage adjustment to the DCF is warranted; (iii) the extent to
8		which other methods of determining the cost of equity provide a reasonable
9		measure of the appropriate cost of common equity; (iv) a flotation cost
10		allowance; and (v) recognition of Columbia's higher investment risk
11		associated with its small size compared to other investor owned natural gas
12		companies and public utilities in general.
13		
14	Q:	**How does the recommendation of the AG compare to the return on equity**
15		**for other natural gas companies as determined in their rate cases?**
16	A:	According to the AUS Monthly Utility Reports dated May 2016, those returns
17		are:

COMPANY		ALLOWED ROE
Atmos Energy Corp.		9.81%
Chesapeake Utilities Corp.		10.46%
Spire, Inc.		NM
New Jersey Resources Corp.		10.30%
Northwest Natural Gas Co.		9.80%
South Jersey Industries, Inc.		9.75%
Southwest Gas Corporation		9.75%
WGL Holdings, Inc.		9.58%
Average		9.92%
NM = Not meaningful		

1   It is obvious that Mr. Baudino's proposed equity return is too low

2   because it is 92 basis points below the average authorized return for gas

3   distribution utilities nationally.

4

5 **Q: Should the Commission consider the future trend in capital cost rates when**

6   **deciding the return on equity issue in this case?**

7 A: Yes. Unlike Mr. Baudino's approach that takes a backward view of interest

8   rates, i.e. six months covering February through July 2016, accommodative

9   FOMC policy has masked the risk of utilities and with prospectively higher

10   interest rates, those conditions will be reversed. To gain a consensus view of

11   future interest rates, I tabulated the forecasts of yields on 10-year Treasury

12   notes published by a variety of well recognized and investor-influencing

1   sources. I chose the 10-year Treasury note because it is available on a consistent

2   basis across all sources. The comparisons are:

	2016	2017	2018	2019	2020	2021	Change in Basis Points
Blue Chip	1.74%	2.15%	3.30%	3.70%	3.90%	4.10%	236
Value Line	1.80%	2.30%	2.80%	3.50%	3.70%	3.70%	190
EIA	2.57%	2.72%	3.27%	3.81%	3.83%	3.77%	120
CBO-The Budget and Economic Outlook	2.60%	3.30%	3.80%	4.00%	4.10%	4.10%	150

3   The universal consensus is that interest rates will increase in the future.

4   The Federal Open Market Committee ("FOMC") policy is in the process of

5   moving from an extremely accommodative to more normal monetary policy.

6   All recognized forecasts indicate a future rise in interest rates.   The FOMC

7   began this process with the end of quantitative easing in October 2014 and the

8   increase in the Fed Funds rate on December 16, 2015.   The uncertainty

9   surrounding the level of interest rates represents one key factor that adds to

10   the risk of common equity. In a WSJ article dated June 9, 2016, the nationally

11   renowned bond investor Bill Gross commented that global bond yields were

12   the lowest "in 500 years of recorded history" and warned that the large

13   number of negative-yielding bonds in the world will eventually lead to "a

14   supernova that will explode one day."   The existence of negative yields in

5

1   Europe and Japan have led global bond investors to purchase higher yielding

2   U.S. government debt. This has resulted in yields for Treasury bonds being

3   depressed due to the supply of Treasury debt not keeping up with global

4   demand. In this environment, it would be unfair to Columbia to set its return

5   based upon the depressed levels of Treasury bond yields because we know

6   that this situation cannot persist indefinitely. Moreover, a September 13, 2016

7   WSJ article warned of another bond market "tantrum" in the situation of rising

8   interest rates and falling prices. The intentions of the FOMC indicate a trough

9   in interest rates has passed and the forecasts show interest rates will rise. The

10   Commission should take the forecast trend toward higher interest rates into

11   account when it sets the cost of equity for Columbia. Mr. Baudino's testimony

12   considers only a three-month historical average of Treasury bond yields. As

13   such, his cost of equity analysis is defective because he has not taken into

14   account the general consensus that interest rates will increase in the future

15   from current levels. It is therefore, indicated that a higher authorized return

16   is warranted in the face of expected higher interest rates.

17

18 **Q: Why is it important to the determination of the cost of equity to know the**

19 **direction of interest rates?**

20 A: As I discussed in my direct testimony, capital costs are interrelated. That is to

1		say, in this environment of low interest rates, the equity risk premium is
2		higher today than in other circumstances. I have reflected a higher risk
3		premium in both my prefiled direct testimony and in the updated cost of
4		equity that I have submitted with my rebuttal testimony. As such, the cost of
5		equity today is not as low as the current level of interest rates would suggest.
6		Moreover, the trend of interest rates should help guide the Commission in
7		picking the point in the range to set the Company's cost of equity. With
8		forecasts showing an increase in interest rates in the future this situation
9		strongly argues for a return in the case this is near the top of the range. Even
10		Mr. Baudino moves to the upper end of his range of DCF returns.
11		
12	**Q:**	**How would investors react to a decision by the Commission to adopt the**
13		**recommendation of the AG?**
14	A:	The investment community would be alarmed if the Commission were to
15		adopt the AG's proposal. Investors would put the Company below the bottom
16		of any reasonable equity return. The return on equity used by the Commission
17		to set rates embodies in a single numerical value a clear signal of the degree of
18		regulatory support for the financial strength of the utilities that it regulates.
19		Although cost allocations, rate design issues, and regulatory policies relative
20		to the cost of service are important considerations, the opportunity to achieve

1   a reasonable return on equity represents a direct signal to the investment

2   community of regulatory support for the utility's financial strength (or lack

3   thereof). In a single figure, the return on equity utilized to set rates provides

4   a common and widely understood benchmark that can be compared from one

5   company to another and is the basis by which returns on all financial assets

6   (stocks – both utility and non-regulated, bonds, money market instruments,

7   and so forth) can be measured. So, while varying degrees of sophistication are

8   required to interpret the meaning of specific Commission policies on technical

9   matters, the return on equity figure is universally understood and

10   communicates to investors the types of returns that they can reasonably expect

11   from an investment in utilities operating in Kentucky.

12

13   **Q: Why should the Commission care what investors think?**

14   A: For a utility to obtain new capital and retain existing capital at reasonable cost

15   and on reasonable terms, the authorized rate of return on common equity

16   must be high enough to satisfy investors with returns that are commensurate

17   with the risk of their investments. The cost of equity proposed by the AG, if

18   adopted by the Commission, would provide a signal to the investment

19   community of unsupportive regulation. That is to say, if the Commission were

20   to adopt the proposal by the AG, it would discourage commitments by

1		investors to Columbia because more attractive risk-adjusted returns are
2		available in other states.
3		
4		**CAPITAL STRUCTURE**
5	**Q:**	**Mr. Kollen has essentially proposed a hypothetical capital structure rather**
6		**than actual capital structure through the imposition of a hypothetical**
7		**common dividend payment in test year. Is his proposal reasonable for**
8		**Columbia?**
9	A:	No. The Company's actual capital structure ratios in this case of 47.58% debt
10		and 52.42% common equity are entirely consistent with the capital structure
11		ratios for the natural gas industry. There is nothing unusual about the
12		Company's actual capital structure that would require any adjustments to it.
13		How the Company's actual capital structure ratios came to be, e.g. through the
14		build-up of retained earnings with the absence of dividends, or payment of
15		dividend and concomitant equity contribution by the parent company, is not
16		the deciding factor as to the reasonableness of the ratios for ratesetting
17		purposes. These ratios are entirely consistent with the capital structure that
18		the Company has maintained historically and are consistent with the ratios for
19		the natural gas industry generally. Moreover, the Company needs the cash
20		flow derived from the absence of dividend payments in 2017 to help finance

1   its ongoing capital requirements, including the AMRP program. As such, Mr.

2   Kollen fails to recognize that there may be instances where it is necessary to

3   withhold dividends to fund infrastructure renewals and replacements.

4

5 **Q:**   **Has anything happened since the Company's prior rate cases that would**

6   **warrant a reduction in common equity component of the Company's**

7   **capital structure here?**

8 A: No. The fundamentals affecting the Company are no different than the time

9   of the Company's last three rate cases. In each of those cases, the common

10   equity ratios were: 52.39% (C-2013-00167), 52.02% (C-2009-00141), and

11   52.09% (C-2007-00008). The Company's common equity ratio in this case is

12   52.42%, and is entirely consistent with the ratios in previous cases. There is

13   nothing in this case that would warrant a reduction in the common equity

14   ratio as proposed by Mr. Kollen. So there is no justification to deviate from

15   the Company's actual capital structure.

16

17 **Q:** **Is the Company's proposed capital structure reasonable by reference to the**

18   **Gas Group?**

19 A: The Company's actual capital structure ratios are within the ratios that

20   investors expect for a natural gas distribution company.   As shown on

1		Rebuttal Attachment PRM-16, I have presented the capital structure ratios for
2		the Gas Group based upon <u>Value Line</u>'s forecasts for the companies that I
3		assembled in my direct testimony. There, it is revealed that the common
4		equity ratio of the companies in the Gas Group average 56.5% to 57.7% across
5		the years. Individually, the common equity ratios extend up to 71%. This
6		shows that there is nothing unreasonable about the Company's proposed
7		52.42% common equity ratio for this case. There is just no reason to adjust it.
8		
9	**Q:**	**Would there be consequences for the Company if a hypothetical 50.80%**
10		**common equity ratio were imposed on it in this case?**
11	A:	Yes. With a 50.80% hypothetical common equity ratio, the Company would
12		be denied an equity return on $4 million of its actual common equity. So with
13		Mr. Baudino's proposed 9.00% equity return, the Company could only hope
14		to experience an 8.72% equity return. **[Please check to confirm]** All investors,
15		both debt and equity, would react unfavorably to such an outcome. Rather,
16		the Commission should support the Company's financial integrity by
17		endorsing its actual capital structure.
18		

1

2 **Q:** **Mr. Baudino has reduced the Company's proposed cost of short-term debt**

3 **from 2.50% to 1.00%. Is that proposal reasonable?**

4 A: No. It is based on the unlikely presumption that NiSource Finance can

5 always avail itself to the commercial paper market, and that commercial

6 paper rates will stay at these unusually low levels. Neither proposition is

7 reasonable for rate-setting purposes.

8

9 **Q:** **Why?**

10 A: First, Mr. Baudino uses a backward-looking historical embedded cost of

11 short-term debt. This approach fails to take into account the magnitude of

12 the forecast increase in interest rates expected in the future. By him moving

13 from 0.72% in 2015 to 1.00% for the test year hardly accommodates the

14 expected upward movement in interest rates. Second, there is no assurance

15 that NiSource Finance will always have access to lower-cost commercial

16 paper. There have been instances in the past, and I am sure they will be

17 repeated in the future, where commercial paper borrowing will not be

18 feasible. For this reason, NiSource Finance has a credit facility with a

19 syndicate of banks to cover the eventuality that commercial paper

20 borrrowings may not be available to it.

1

UPDATED COST OF EQUITY

3 **Q:** **Are you sponsoring any additional exhibits with your rebuttal testimony?**

4 A: Yes. I have updated selected attachments that were part of my original

5   prefiled direct testimony. The updates include: Cost of Equity – page 2 of

6   Attachment PRM-1, Dividend Yields – Attachment PRM-7, Historical Growth

7   Rates – Attachment PRM- 8, Projected Growth Rates – Attachment PRM-9,

8   Financial Risk Adjustment – Attachment PRM-10, Interest Rates for

9   Investment Grade Public Utility Bonds - Attachment PRM-12 pages 1 and 3,

10   Component Inputs for the Capital Market Pricing Model – Attachment PRM-

11   14 pages 1 and 2, and Comparable Earnings – Attachment PRM- 15. For the

12   purpose of my rebuttal testimony, I have maintained the same schedule

13   identifications, so that the updates can be traced to each original attachment.

14   The remaining attachments are not sensitive to the five-month update, as they

15   reflect mostly annual data.

16

17 **Q:** **Why have you updated your ROE analysis with later data?**

18 A: The data that was contained in my original Attachments ended with market

19   data through March 2016. So that the freshness of the data is not an issue that

20   would cloud the rate of return issue in this case and to respond to Staff

1		interrogatory 3-21, I have updated my market data through August 2016,
2		because I use month-end data in my analysis.
3		
4	**Q:**	**Does the updated information impact your recommendation in this case?**
5	A:	No. The updated market data indicates that my original cost of equity of 11.0%
6		continues to be appropriate. Some of the models show an increase in the
7		results using later data and others show a decline. Overall, the changes offset.
8		As to the discounted cash flow (DCF) measure of the cost of equity, the
9		average six-month dividend yield component decreased (i.e., 3.11% to 2.83%),
10		while the growth rate component has increased somewhat (i.e., 6.0% to 6.25%),
11		and the leverage adjustment also increased (i.e., 0.82% to 0.89%). This leaves
12		the DCF cost rate at 10.17% vs. 10.13% in the prefiled direct testimony.
13		Declines in the update are revealed by the risk premium and capital asset
14		pricing model (CAPM) measures of the cost of equity. In these models, I have
15		reduced the projection of the yield on long-term treasury bonds from 3.75%
16		that I used in my direct testimony to 3.25% in my update. An offsetting change
17		in the update of the risk premium approach relates to the expansion of the
18		spread between the cost of public utility debt and the yield on 30-year treasury
19		bonds. While the spread that existed at the time of my prefiled direct
20		testimony was 1.25%, it has now increased somewhat to 1.35%. This shows

1		that the riskiness of public utilities has increased somewhat over the past five
2		months. As a result, the risk premium cost of equity has decreased from
3		11.70% to 11.30%. The CAPM cost rate has also decreased over the past five
4		months. The leveraged adjusted betas for my water group have remained
5		unchanged. The risk-free rate of return has been reduced by 0.50% as
6		indicated above. The market premium has increased due to the turmoil
7		affecting the stock market. The CAPM result has decreased from 11.45% to
8		11.25%. I have also updated the Comparable Earnings approach. Overall, the
9		update reveals a range of the equity returns from 10.17% to 11.30% using the
10		market-based models, i.e., DCF, Risk Premium and CAPM. This shows that
11		my original cost of equity recommendation continues to be reasonable.
12		
13		**COST OF EQUITY**
14	**Q:**	**Mr. Baudino asserts that the natural gas industry continues to be a safe,**
15		**solid choice for investors. Do you agree?**
16	A.	Only in part. The natural gas utility industry is in a period of increased
17		capital expenditures that will heighten its risk profile. Significant amounts of
18		capital will be required by the industry to meet increasingly stringent
19		environmental standards and to address aging infrastructure needs. The
20		large amounts of new capital required by the industry will pressure its

1   financial profile. To be successful in attracting the capital that it needs, the

2   industry will need to provide investors with competitive returns.

3

4   **Q: Among the variables that Mr. Baudino considered in his growth rate**

5   **analysis for DCF purposes was the dividends per share forecast by <u>Value</u>**

6   **<u>Line</u>. Is that a valid measure for DCF purposes, or are there serious**

7   **limitations to this measure of growth?**

8   A.   There are. As I describe in my prefiled direct testimony, forecast earnings

9   growth is the only valid measure of growth for DCF purposes. The theory of

10   DCF indicates that the value of a firm's equity (i.e., share price) will grow at

11   the same rate as earnings per share and dividend growth will equal earnings

12   growth with a constant payout ratio. Unfortunately, a constant payout ratio

13   reflects neither the reality of the equity markets or investor expectations.

14   Therefore, to reflect investor expectations within the limitations of the DCF

15   model, earnings per share growth, which is the basis for the capital gains

16   yield and the source of dividend payments, must be given primary

17   emphasis. We can clearly see from Exhibit RAB-4 that dividend growth

18   provides a DCF return that is an outlier. There are no other DCF returns

19   shown on that exhibit that are near 7.60%. Indeed, the average of the DCF

1   returns for the remaining growth rates using earnings forecasts is 9.08%

2   (9.63% + 9.37% + 8.25% = 27.25% ÷ 3).

3

4   **Q.   As to the DCF growth component, what financial variables should be**

5   **given greatest weight when assessing investor expectations?**

6   A.   As noted above, to properly reflect investor expectations within the

7   limitations of the DCF model, earnings per share growth, which is the basis

8   for the capital gains yield and the source of dividend payments, must be

9   given greatest weight. The reason that earnings per share growth is the

10   primary determinant of investor expectations rests with the fact that the

11   capital gains yield (i.e., price appreciation) will track earnings growth with a

12   constant price earnings multiple (a key assumption of the DCF model). It is

13   also important to recognize that analysts' forecasts significantly influence

14   investor growth expectations. Moreover, it is instructive to note that

15   Professor Myron Gordon, the foremost proponent of the DCF model in

16   public utility rate cases, has established that the best measure of growth for

17   use in the DCF model are forecasts of earnings per share growth.[1]

18

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[1] "Choice Among Methods of Estimating Share Yield," <u>The Journal of Portfolio Management</u>, Spring
1989 by Gordon, Gordon & Gould.

1 **Q:** **Have you detected any anomalies in the earnings growth rates shown by**

2   **Mr. Baudino?**

3 A. There are several. First, the 1.00% earnings growth rate for New Jersey

4   Resources is an anomaly. It is significantly dissimilar to the earnings growth

5   rates for New Jersey Resources available from other sources (i.e., Zacks and

6   Thomson/Reuters). Second, the 3.00% earnings growth rate for Chesapeake

7   Utilities reported by Thomson/Reuters is clearly outside the range for the

8   other gas companies. By removing those growth rates, the DCF returns

9   become 9.17% and 9.37%.

10

11 **Q:** **Mr. Baudino has also shown the BxR growth rates, but apparently has not**

12   **employed them. What are your observations concerning BxR growth?**

13 A. Mr. Baudino showed the Value Line BxR growth rates. The retention growth

14   rates published by Value Line are calculated with year-end book values,

15   rather than average book values. Value Line defines "return on equity" as

16   follows:

17   Percent Earned Common Equity – net profit less
18   preferred dividends divided by common equity (i.e.,
19   net worth less preferred equity at liquidation or
20   redemption value), expressed as a percentage. See
21   Percent Earned Total Capital.
22

1   Without an adjustment to convert the Value Line forecast returns from year-

2   end to average book values, there is a downward bias in the results. This is

3   because with an increasing book value driven by retention growth, the

4   average book value will be less than the year-end book value. For that

5   reason, the Federal Energy Regulatory Commission ("FERC") adjusts the

6   year-end returns to derive the average yearly return, using the formula 2 (1 +

7   G) / (2 + G) (see 92 FERC ¶ 61,070). Generally speaking, this adjustment

8   increases the retention growth rate.

9

10   **Q:**   **Has Mr. Baudino recognized external financing growth related to the BxR**

11   **rates?**

12   A.   No. This omission results in a further downward bias in the BxR growth rate

13   analysis. Forecasts by Value Line indicate that future growth from external

14   stock financing will add to the growth in equity. This would result in an

15   internal/external growth rate higher than that reported by Mr. Baudino.

16

17   **Q:**   **Mr. Baudino also used the CAPM as part of his analysis of the cost of**

18   **equity. As the risk-free rate of return component of the CAPM, he studied**

19   **the yields over a 6-month period for 20-year Treasury bonds and 5-year**

20   **Treasury notes. Do you agree?**

1   A: I agree with his use of the yields on 20-year Treasury bonds, but not his use

2   of the yields on 5-year Treasury notes. The term of the 5-year Treasury note

3   is too short to be useful here because it does not fit the long-term horizon of

4   public utility ratesetting (i.e., the average life of utility plant exceeds five

5   years). Further, as maturities are shortened for Treasury securities, they are

6   more susceptible to monetary policy actions of the FOMC. Indeed, since the

7   credit crisis, the FOMC has been taking aggressive actions to support the

8   economy with very low short-term interest rates. Since yields on shorter

9   term Treasury obligations are more influenced by FOMC policy actions than

10   are long-term Treasury yields, the shorter term yields should be avoided in

11   cost of equity analyses.

12

13   Q: **In addition to a forward-looking (i.e., expectational) measurement of the**

14   **market premium (Rm-Rf) component of the CAPM, Mr. Baudino also**

15   **submitted historical data in this regard. Are any of his historical**

16   **measurement procedures inappropriate for CAPM purposes?**

17   A: Only one. Mr. Baudino has used geometric means, as well as arithmetic

18   means for identifying the market premium using historical data (see Exhibit

19   RAB-6). Arithmetic means are appropriate, but geometric means are not. As

20   I explained in my direct testimony, only the arithmetic means are valid

| 1 | measures of the market premium in the CAPM. As stated in the 2003 |

| 2 | Yearbook published by Ibbotson Associates: |

3	The arithmetic mean is the rate of return which, when
4	compounded over multiple periods, gives the mean of the
5	probability distribution of ending wealth values….This
6	makes the arithmetic mean return appropriate for
7	forecasting, discounting, and computing the cost of capital.
8	The discount rate that equates expected (mean) future
9	values with the present value of an investment is that
10	investment's cost of capital. The logic of using the discount
11	rate as the cost of capital is reinforced by noting that
12	investors will discount their expected (mean) ending wealth
13	values from an investment back to the present using the
14	arithmetic mean, for the reason given above. They will,
15	therefore, require such an expected (mean) return
16	prospectively (that is, in the present looking toward the
17	future) to commit their capital to the investment.
18	
19	In the 2006 Yearbook, Ibbotson added:

20	A simple example illustrates the difference between
21	geometric and arithmetic means. Suppose $1.00 was
22	invested in a large company stock portfolio that experiences
23	successive annual returns of +50 percent and -50 percent.
24	At the end of the first year, the portfolio is worth $1.50. At
25	the end of the second year, the portfolio is worth $0.75. The
26	annual arithmetic mean is 0.0 percent, whereas the annual
27	geometric mean is -13.4 percent. Both are calculated as

$$r_A = \frac{1}{2}(0.50 - 0.50) = 0.0, \text{ and}$$

$$r_G = \left[\frac{0.75}{1.00}\right]^{\frac{1}{2}} - 1 = -0.134$$

| 28 | follows: |

1	The geometric mean is backward-looking, measuring the
2	change in wealth over more than one period. On the other
3	hand, the arithmetic mean better represents a typical
4	performance over single periods.
5	In general, the geometric mean for any time period is less
6	than or equal to the arithmetic mean. The two means are
7	equal only for a return series that is constant (i.e., the same
8	return in every period). For a non-constant series, the
9	difference between the two is positively related to the
10	variability or standard deviation of the returns. For
11	example, in Table 6-7, the difference between the arithmetic
12	and geometric mean is much larger for risky large company
13	stocks than it is for nearly riskless Treasury bills.
14	
15	As such, the CAPM results shown on his Exhibit RAB-6, which are linked to
16	the geometric mean, are not meaningful for CAPM purposes.
17	Furthermore, we know that the geometric means from the
18	Ibbotson/Chen data are suspect because they are so far out of line with the
19	expectational market return data. That is to say, the risk premiums are 7.79%
20	and 8.68% using expectational data, while Mr. Baudino shows risk premiums
21	of 5.03% and 7.03% (see Exhibit RAB-6) using historical data. As noted
22	above, the Ibbotson/Chen historical data using geometric means, which is
23	just 5.03%, is an outlier.
24	

1　**Q:　Mr. Baudino presents the results of his CAPM showing a range of 7.53% to**

2　**7.7% using expectational data, and only 5.77% to 7.22% using historical**

3　**data. Please comment.**

4　A:　With these ranges, Mr. Baudino appears to discount all of the CAPM results

5　　　as not plausible. All of these returns clearly do not support his 9.00% cost of

6　　　equity proposal.

7

8　**Q:　Mr. Baudino provides a critique of your direct testimony and highlights**

9　**various areas where he believes that you have overstated the Company's**

10　**cost of equity.**

11　**Mr. Baudino also questions the propriety of your leverage adjustment.**

12　**Please respond.**

13　A:　Mr. Baudino has not properly recognized that my leverage adjustment is not

14　　　a market-to-book ratio adjustment. In response to his specific criticisms, my

15　　　adjustment does not alter the use of book values of common equity,

16　　　preferred stock, and long-term debt in calculating the weighted average cost

17　　　of capital. Next, my adjustment does not address any of the factors that Mr.

18　　　Baudino identifies would cause market prices to deviate from book value.

19　　　And, my adjustment is not an attempt to "prop up high market-to-book

20　　　ratios" because it does not provide a return that supports any particular M/B

1		ratio, high or low. Further, my leverage adjustment does not address any
2		distinction between investors' expected returns and their required returns.
3		My adjustment deals only with risk differences attributed to changes in
4		financial risk. As to the rating agencies, they are concerned primarily with a
5		company's cash flow and the ability to adequately cover debt service. While
6		the rating agencies have specific benchmarks for the proportion of debt to
7		capitalization, they do not calculate market based measures of the cost of
8		equity and link those results to a company's book value capital structure.
9		Hence, they would not need to address this issue.
10		
11	**Q:**	**Mr. Baudino asserts that your proposed DCF growth rate is slightly greater**
12		**than the high end of the range of your analysis. Please respond.**
13	A.	My DCF growth rate is entirely within investor growth expectations for the
14		gas utilities and is fully supported by my data. Focusing on my updated
15		schedules, Attachment PRM-9 shows the analysts' forecasts of average
16		earnings growth for the gas utilities were 5.45% by FirstCall/IBES, 6.30% by
17		Zacks, 6.65% by Morningstar, 6.31% by SNL, and 5.69% by ValueLine. Three
18		out of five forecasts of earnings per share growth are above the growth rate
19		that I have used, and some by a significant measure. The 6.25% growth rate
20		that I used in my updated DCF analysis is entirely within this range.

1

2   **Q: Mr. Baudino seems to believe that using historical data for the Risk**

3   **Premium approach creates a problem with using historical premiums that**

4   **reflect current investor expectations. Please respond.**

5   A: I share Mr. Baudino's concern in this regard. There are two ways to deal

6   with this issue. First, an analyst can use all reliable data to establish the risk

7   premium, thus avoiding a bias in selecting a particular period. This

8   represents one of the approaches that Mr. Baudino employed to arrive at his

9   market premium component of the CAPM. Second, an analyst can develop a

10   risk premium from historical data that seeks to emulate investors' current

11   expectations. I followed the later approach. The value of this approach is

12   that it allows the risk premium to vary over time -- which is what my risk

13   premium does.

14

15 **Q: Mr. Baudino suggests that your CAPM results are overstated. Please**

16   **respond.**

17 A: I used sources and methodologies similar to those employed by Mr.

18   Baudino. For example, I used the Value Line source. Second, I made a DCF

19   calculation for the S&P 500 that employed analysts' estimates to calculate the

20   DCF return. Finally, I tempered these forecasts with historical data. As to

1   the issue of geometric means, I have previously explained why these

2   measures are inappropriate for use in the CAPM and will not repeat them

3   here.

4   As to my use of unlevered and levered betas, I employed the Hamada

5   formula, which is merely an extension of the Modigliani & Miller formula

6   that I used in the DCF. As a consequence, the explanation that I provided

7   previously for the leverage adjustment also applies to the levered betas. It is

8   only because the regulatory process uses book values to calculate the

9   weighted average cost of capital that we need to address this issue here.

10   Regarding Mr. Baudino's observations about the size adjustment, the

11   2015 Yearbook clearly shows that the size premiums were developed from

12   all types of companies, including public utilities.

13

14 **Q: Mr. Baudino also finds fault with your Comparable Earnings. Please**

15 **respond.**

16 A: As noted previously, I did not factor the results of the Comparable Earnings

17   method directly into my recommended cost of equity for CKY. Rather, the

18   results of the Comparable Earnings approach were used to confirm the

19   results of the market based models (i.e., DCF, Risk Premium, and CAPM)

20   that I did use to arrive at my recommended cost of equity.

1

2   **Q: Does this complete your Prepared Rebuttal Testimony?**

3   A: Yes, it does.

4

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the matter of adjustment of rates of	)	
Columbia Gas of Kentucky, Inc.	)	Case No. 2016-00162

**REBUTTAL ATTACHMENT TO ACCOMPANY THE
REBUTTAL TESTIMONY OF PAUL R. MOUL
ON BEHALF OF COLUMBIA GAS OF KENTUCKY, INC**.

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COLUMBIA GAS OF KENTUCKY, INC.

Proxy Group of Natural Gas Companies
Capital Structure Ratios

	2016		2017		2019-21	
	Long-term Debt Ratio	Common Equity Ratio	Long-term Debt Ratio	Common Equity Ratio	Long-term Debt Ratio	Common Equity Ratio
Atmos Energy Corp.	40.0%	60.0%	43.0%	57.0%	45.0%	55.0%
Chesapeake Utilities Corp.	29.0%	71.0%	29.0%	71.0%	30.0%	70.0%
New Jersey Resources Corp.	43.0%	57.0%	43.0%	57.0%	40.5%	59.5%
Northwest Natural Gas Co.	43.0%	57.0%	43.0%	57.0%	43.0%	57.0%
South Jersey Industries	41.5%	58.5%	42.5%	57.5%	45.0%	55.0%
Southwest Gas	47.0%	53.0%	48.0%	52.0%	48.5%	51.5%
Spire Inc.	52.5%	47.5%	52.0%	48.0%	51.5%	48.5%
WGL holdings, Inc.	41.5%	57.5%	41.5%	57.0%	43.5%	55.5%
Average - all companies	42.2%	57.7%	42.8%	57.1%	43.4%	56.5%

Source: The Value Line Investment Survey, September 2, 2016

Columbia Exhibit No. _____.

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the matter of adjustment of rates of)
Columbia Gas of Kentucky, Inc.)   Case No. 2016-00162

UPDATED
ATTACHMENTS TO ACCOMPANY THE
TESTIMONY OF PAUL R. MOUL
ON BEHALF OF COLUMBIA GAS OF KENTUCKY, INC.

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COLUMBIA GAS OF KENTUCKY, INC.

Columbia Gas of Kentucky, Inc.
Cost of Equity
as of August 31, 2016

Discounted Cash Flow (DCF)	D_1/P_0 [1]	+	g [2]	+	lev. [3]	=	k	x	flot. [4]	=	k
Gas Group	2.83%	+	6.25%	+	0.89%	=	9.97%	x	1.02	=	10.17%

Risk Premium (RP)			I [5]	+	RP [6]	=	k	+	flot.	=	k
Gas Group			4.60%	+	6.50%	=	11.10%	+	0.20%	=	11.30%

Capital Asset Pricing Model (CAPM)	Rf [7]	+	ß [8]	x (	Rm-Rf [9]	) +	size [10]	=	k	+	flot.	=	k
Gas Group	3.25%	+	0.88	x (	7.73%	) +	1.00%	=	11.05%	+	0.20%	=	11.25%

Comparable Earnings (CE)	Historical [11]	Forecast [11]	Average
Comparable Earnings Group	15.1%	14.0%	14.55%

References
[1] Attachment PRM-7 page 1
[2] Attachment PRM-9 page 1
[3] Attachment PRM-10 page 1
[4] Attachment PRM-11 page 1
[5] A-rated public utility bond yield comprised of a 3.25% risk-free rate of return (Attachment PRM-14 page 2) and a yield spread of 1.35% (Attachment PRM-12 page 3)
[6] Attachment PRM-13 page 1
[7] Attachment PRM-14 pages 1 & 2
[8] Attachment PRM-10 page 1
[9] Attachment PRM-14 page 2
[10] Attachment PRM-14 page 3
[11] Attachment PRM-15 page 2

Monthly Dividend Yields for
Natural Gas Group
for the Twelve Months Ending August 2016

Company	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	12-Month Average	6-Month Average	3-Month Average
Atmos Energy Corp (ATO)	2.84%	2.85%	2.69%	2.68%	2.70%	2.67%	2.44%	2.42%	2.27%	2.33%	2.31%	2.07%	2.11%	2.28%	2.41%	2.23%	2.15%
Chesapeake Utilities Corp (CPK)	2.24%	2.35%	2.17%	2.21%	2.17%	2.03%	1.83%	1.85%	1.83%	2.06%	2.12%	1.85%	1.91%	1.92%	2.00%	1.95%	1.89%
Spire Inc. (SR)	3.42%	3.50%	3.38%	3.36%	3.38%	3.31%	3.08%	3.01%	2.90%	3.08%	3.10%	2.77%	2.84%	3.05%	3.11%	2.96%	2.89%
New Jersey Resources Corporation (NJR)	3.34%	3.42%	3.20%	3.04%	3.22%	2.92%	2.74%	2.79%	2.64%	2.70%	2.75%	2.49%	2.59%	2.87%	2.83%	2.67%	2.65%
Northwest Natural Gas (NWN)	4.30%	4.25%	4.09%	3.92%	3.85%	3.72%	3.60%	3.76%	3.49%	3.63%	3.42%	2.90%	2.88%	3.14%	3.53%	3.24%	2.97%
South Jersey Industries Inc (SJI)	4.17%	4.21%	3.99%	4.00%	4.64%	4.50%	4.27%	4.19%	3.71%	3.80%	3.68%	3.34%	3.33%	3.58%	3.92%	3.57%	3.42%
Southwest Gas Corp (SWX)	2.89%	2.94%	2.79%	2.65%	2.89%	2.95%	2.77%	2.66%	2.47%	2.79%	2.60%	2.29%	2.33%	2.58%	2.65%	2.51%	2.40%
WGL Holdings Inc (WGL)	3.32%	3.43%	3.23%	2.98%	3.01%	2.96%	2.78%	2.72%	2.57%	2.88%	3.00%	2.77%	2.76%	3.12%	2.90%	2.85%	2.88%
Average	**3.32%**	**3.37%**	**3.19%**	**3.11%**	**3.23%**	**3.13%**	**2.94%**	**2.93%**	**2.74%**	**2.91%**	**2.87%**	**2.56%**	**2.59%**	**2.82%**	**2.92%**	**2.75%**	**2.66%**

Note: Monthly dividend yields are calculated by dividing the annualized quarterly dividend by the month-end closing stock price adjusted by the fraction of the ex-dividend.

Source of Information: http://performance.morningstar.com/stock/performance-return
http://www.snl.com/interactivex/dividends

Forward-looking Dividend Yield

1/2 Growth	D_0/P_0	(.5g)	D_1/P_0	
	2.75%	1.031250	2.83%	$K = \dfrac{D_0\,(1+g)^0 + D_0\,(1+g)^0 + D_0\,(1+g)^1 + D_0\,(1+g)^1}{P_0} + g$

Discrete	D_0/P_0	Adj.	D_1/P_0	
	2.75%	1.038767	2.85%	$K = \dfrac{D_0\,(1+g)^{25} + D_0\,(1+g)^{50} + D_0\,(1+g)^{75} + D_0\,(1+g)^{1.00}}{P_0} + g$

Quarterly	D_0/P_0	Adj.	D_1/P_0	
	0.6871%	1.015272	2.82%	$K = \left[\left(1 + \dfrac{D_0\,(1+g)^{25}}{P_0}\right)^4 - 1\right] + g$
Average			2.83%	

Growth rate: 6.25%

K: 9.08%

Historical Growth Rates
Earnings Per Share, Dividends Per Share,
Book Value Per Share, and Cash Flow Per Share

Gas Group	Earnings per Share Value Line 5 Year	Earnings per Share Value Line 10 Year	Dividends per Share Value Line 5 Year	Dividends per Share Value Line 10 Year	Book Value per Share Value Line 5 Year	Book Value per Share Value Line 10 Year	Cash Flow per Share Value Line 5 Year	Cash Flow per Share Value Line 10 Year
Atmos Energy Corp.	7.00%	5.50%	2.50%	2.00%	5.00%	5.00%	4.50%	5.00%
Chesapeake Utilities Corp.	10.00%	8.00%	5.00%	3.50%	8.00%	9.00%	11.50%	7.00%
Spire, Inc.	-1.00%	3.00%	3.00%	2.50%	8.00%	7.50%	0.50%	4.00%
New Jersey Resources Corp.	6.50%	7.50%	7.00%	7.00%	6.50%	8.00%	7.50%	6.50%
Northwest Natural Gas	-5.00%	1.00%	3.00%	3.50%	2.50%	3.00%	-1.00%	2.00%
South Jersey Industries, Inc.	4.00%	7.00%	9.50%	9.00%	8.50%	8.00%	6.00%	7.50%
Southwest Gas Corp.	10.00%	8.50%	9.00%	6.00%	5.50%	5.50%	6.50%	5.00%
WGL Holdings, Inc.	2.50%	2.50%	3.50%	3.00%	2.50%	4.00%	2.50%	2.00%
Average	4.25%	5.38%	5.31%	4.56%	5.81%	6.25%	4.75%	4.88%

Source of Information: Value Line Investment Survey, September 2, 2016

Analysts' Five-Year Projected Growth Rates
Earnings Per Share, Dividends Per Share,
Book Value Per Share, and Cash Flow Per Share

					Value Line				
Gas Group	I/B/E/S First Call	Zacks	Morningstar	SNL	Earnings Per Share	Dividends Per Share	Book Value Per Share	Cash Flow Per Share	Percent Retained to Common Equity
Atmos Energy Corp.	7.30%	7.20%	6.70%	6.90%	6.50%	6.50%	3.50%	5.00%	5.50%
Chesapeake Utilities Corp.	3.00%	NA	-	NA	8.50%	6.00%	6.50%	7.00%	8.00%
Spire, Inc.	4.78%	4.60%	-	4.80%	9.00%	3.50%	4.50%	9.50%	5.00%
New Jersey Resources Corp.	6.50%	6.50%	3.30%	6.50%	1.00%	3.00%	6.50%	1.50%	4.50%
Northwest Natural Gas	4.00%	4.00%	-	4.00%	7.00%	2.00%	2.50%	4.00%	3.50%
South Jersey Industries, Inc.	6.00%	10.00%	10.00%	10.00%	3.00%	6.50%	8.00%	2.50%	1.50%
Southwest Gas Corp.	4.00%	4.50%	-	4.00%	7.00%	8.50%	3.00%	6.50%	6.00%
WGL Holdings, Inc.	8.00%	7.30%	6.60%	8.00%	3.50%	2.50%	6.00%	3.50%	3.50%
Average	5.45%	6.30%	6.65%	6.31%	5.69%	4.81%	5.06%	4.94%	4.69%

Source of Information :   Yahoo Finance, August 30, 2016
Zacks, August 30, 2016
Morningstar, August 30, 2016
SNL, August 30, 2016
Value Line Investment Survey, September 2, 2016

Gas Group
Financial Risk Adjustment

		ATMOS Energy (NYSE:ATO)	Chesapeake Utilities (NYSE:CPK)	Spire, Inc. (NYSE:__)	New Jersey Resources (NYSE:NJR)	Northwest Natural Gas (NYSE:NWN)	South Jersey Industries (NYSE:SJI)	Southwest Gas (SWX)	WGL Holdings (NYSE:WGL)	Average
Fiscal Year		09/30/15	12/31/15	09/30/15	09/30/15	12/31/15	12/31/15	12/31/15	09/30/15	
Capitalization at Fair Values										
Debt(D)		2,669,323	165,100	1,944,200	817,319	667,168	1,079,000	1,645,684	1,057,900	1,255,712
Preferred(P)		0	0	0	0	0	0	0	28,173	3,522
Equity(E)		5,904,038	866,610	2,363,058	2,484,279	1,388,080	1,669,111	2,613,347	2,867,852	2,519,547
Total		8,573,361	1,031,710	4,307,258	3,301,598	2,055,248	2,748,111	4,259,031	3,953,925	3,778,780
Capital Structure Ratios										
Debt(D)		31.14%	16.00%	45.14%	24.76%	32.46%	39.26%	38.64%	26.76%	31.77%
Preferred(P)		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.71%	0.09%
Equity(E)		68.86%	84.00%	54.86%	75.24%	67.54%	60.74%	61.36%	72.53%	68.14%
Total		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Common Stock										
Issued		101,478.818	15,270.659	43,335.012	85,531.423	27,427.000	70,965.622	47,377.575	49,728.662	
Treasury		0.000	0.000	0.000	2,804.847	0.000	0.000	0.000	0.000	
Outstanding		101,478.818	15,270.659	43,335.012	82,726.576	27,427.000	70,965.622	47,377.575	49,728.662	
Market Price		$ 58.18	$ 56.75	$ 54.53	$ 30.03	$ 50.61	$ 23.52	$ 55.16	$ 57.67	
Capitalization at Carrying Amounts										
Debt(D)		2,460,000	153,700	1,851,500	807,845	601,700	1,035,800	1,581,454	944,200	1,179,525
Preferred(P)		0	0	0	0	0	0	0	28,173	3,522
Equity(E)		3,194,797	358,138	1,573,600	1,106,956	780,972	1,037,539	1,594,408	1,243,247	1,361,207
Total		5,654,797	511,838	3,425,100	1,914,801	1,382,672	2,073,339	3,175,862	2,215,620	2,544,254
Capital Structure Ratios										
Debt(D)		43.50%	30.03%	54.06%	42.19%	43.52%	49.96%	49.80%	42.62%	44.46%
Preferred(P)		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.27%	0.16%
Equity(E)		56.50%	69.97%	45.94%	57.81%	56.48%	50.04%	50.20%	56.11%	55.38%
Total		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Betas	Value Line	0.75	0.60	0.70	0.80	0.65	0.80	0.75	0.75	0.73

Hamada

	Bl	=	Bu	[1+	(1 - t)	D/E	+	P/E	]
	0.73	=	Bu	[1+	(1-0.35)	0.4662	+	0.0013	]
	0.73	=	Bu	[1+	0.65	0.4662	+	0.0013	]
	0.73	=	Bu	1.3043					
	0.56	=	Bu						

Hamada

	Bl	=	0.56	[1+	(1 - t)	D/E	+	P/E	]
	Bl	=	0.56	[1+	0.65	0.8028	+	0.0029	]
	Bl	=	0.56	1.5247					
	Bl	=	0.85						

M&M

	ku	=	ke	-	(((	ku	-	i	)		1-t	)		D	/	E	-	(ku	- d	)	P	/	E
	7.86%	=	9.08%	-	(((	7.86%	-	3.84%	)		0.65	)		31.77%	/	68.14%	-	7.86%	- 5.68%	)	0.09%	/	68.14%
	7.86%	=	9.08%	-	(((	4.02%			)		0.65	)		0.4662			-	2.18%		)	0.0013		
	7.86%	=	9.08%	-	((	2.61%			)			)		0.4662			-	2.18%		)	0.0013		
	7.86%	=	9.08%	-		1.22%											-	0.00%					

M&M

	ke	=	ku	+	(((	ku	-	i	)		1-t	)		D	/	E	+	(ku	- d	)	P	/	E
	9.97%	=	7.86%	+	(((	7.86%	-	3.84%	)		0.65	)		44.46%	/	55.38%	+	7.86%	- 5.68%	)	0.16%	/	55.38%
	9.97%	=	7.86%	+	(((	4.02%			)		0.65	)		0.8028			+	2.18%		)	0.0029		
	9.97%	=	7.86%	+	((	2.61%			)			)		0.8028			+	2.18%		)	0.0029		
	9.97%	=	7.86%	+		2.10%											+	0.01%					

Interest Rates for Investment Grade Public Utility Bonds
Yearly for 2011-2015
and the Twelve Months Ended August 2016

Years	Aa Rated	A Rated	Baa Rated	Average
2011	4.78%	5.04%	5.57%	5.13%
2012	3.83%	4.13%	4.86%	4.27%
2013	4.24%	4.48%	4.98%	4.57%
2014	4.19%	4.28%	4.80%	4.42%
2015	4.00%	4.12%	5.03%	4.38%
Five-Year Average	4.21%	4.41%	5.05%	4.55%

Months				
Sep-15	4.25%	4.39%	5.42%	4.68%
Oct-15	4.13%	4.29%	5.47%	4.63%
Nov-15	4.22%	4.40%	5.57%	4.73%
Dec-15	4.16%	4.35%	5.55%	4.69%
Jan-16	4.09%	4.27%	5.49%	4.62%
Feb-16	3.94%	4.11%	5.28%	4.44%
Mar-16	3.93%	4.16%	5.12%	4.40%
Apr-16	3.74%	4.00%	4.75%	4.16%
May-16	3.65%	3.93%	4.60%	4.06%
Jun-16	3.56%	3.78%	4.47%	3.93%
Jul-16	3.36%	3.57%	4.16%	3.70%
Aug-16	3.39%	3.59%	4.20%	3.73%
Twelve-Month Average	3.87%	4.07%	5.01%	4.31%
Six-Month Average	3.61%	3.84%	4.55%	4.00%
Three-Month Average	3.44%	3.65%	4.28%	3.79%

Source: Mergent Bond Record

4.40%

A rated Public Utility Bonds over 30-Year Treasuries

Year	A-rated Public Utility	30-Year Treasuries		Year	A-rated Public Utility	30-Year Treasuries		Year	A-rated Public Utility	30-Year Treasuries		Year	A-rated Public Utility	30-Year Treasuries		Year	A-rated Public Utility	30-Year Treasuries	
		Yield	Spread			Yield	Spread			Yield	Spread			Yield	Spread			Yield	Spread
Jan-99	6.97%	5.16%	1.81%	Jan-03	7.07%			Jan-07	5.96%	4.85%	1.11%	Jan-11	5.57%	4.52%	1.05%	Jan-15	3.58%	2.46%	1.12%
Feb-99	7.09%	5.37%	1.72%	Feb-03	6.93%			Feb-07	5.90%	4.82%	1.08%	Feb-11	5.68%	4.65%	1.03%	Feb-15	3.67%	2.57%	1.10%
Mar-99	7.26%	5.58%	1.68%	Mar-03	6.79%			Mar-07	5.85%	4.72%	1.13%	Mar-11	5.56%	4.51%	1.05%	Mar-15	3.74%	2.63%	1.11%
Apr-99	7.22%	5.55%	1.67%	Apr-03	6.64%			Apr-07	5.97%	4.87%	1.10%	Apr-11	5.55%	4.50%	1.05%	Apr-15	3.75%	2.59%	1.16%
May-99	7.47%	5.81%	1.66%	May-03	6.36%			May-07	5.99%	4.90%	1.09%	May-11	5.32%	4.29%	1.03%	May-15	4.17%	2.96%	1.21%
Jun-99	7.74%	6.04%	1.70%	Jun-03	6.21%			Jun-07	6.30%	5.20%	1.10%	Jun-11	5.26%	4.23%	1.03%	Jun-15	4.39%	3.11%	1.28%
Jul-99	7.71%	5.98%	1.73%	Jul-03	6.57%			Jul-07	6.25%	5.11%	1.14%	Jul-11	5.27%	4.27%	1.00%	Jul-15	4.40%	3.07%	1.33%
Aug-99	7.91%	6.07%	1.84%	Aug-03	6.78%			Aug-07	6.24%	4.93%	1.31%	Aug-11	4.69%	3.65%	1.04%	Aug-15	4.25%	2.86%	1.39%
Sep-99	7.93%	6.07%	1.86%	Sep-03	6.56%			Sep-07	6.18%	4.79%	1.39%	Sep-11	4.48%	3.18%	1.30%	Sep-15	4.39%	2.95%	1.44%
Oct-99	8.06%	6.26%	1.80%	Oct-03	6.43%			Oct-07	6.11%	4.77%	1.34%	Oct-11	4.52%	3.13%	1.39%	Oct-15	4.29%	2.89%	1.40%
Nov-99	7.94%	6.15%	1.79%	Nov-03	6.37%			Nov-07	5.97%	4.52%	1.45%	Nov-11	4.25%	3.02%	1.23%	Nov-15	4.40%	3.03%	1.37%
Dec-99	8.14%	6.35%	1.79%	Dec-03	6.27%			Dec-07	6.16%	4.53%	1.63%	Dec-11	4.33%	2.98%	1.35%	Dec-15	4.35%	2.97%	1.38%
Jan-00	8.35%	6.63%	1.72%	Jan-04	6.15%			Jan-08	6.02%	4.33%	1.69%	Jan-12	4.34%	3.03%	1.31%	Jan-16	4.27%	2.86%	1.41%
Feb-00	8.25%	6.23%	2.02%	Feb-04	6.15%			Feb-08	6.21%	4.52%	1.69%	Feb-12	4.36%	3.11%	1.25%	Feb-16	4.11%	2.62%	1.49%
Mar-00	8.28%	6.05%	2.23%	Mar-04	5.97%			Mar-08	6.21%	4.39%	1.82%	Mar-12	4.48%	3.28%	1.20%	Mar-16	4.16%	2.68%	1.48%
Apr-00	8.29%	5.85%	2.44%	Apr-04	6.35%			Apr-08	6.29%	4.44%	1.85%	Apr-12	4.40%	3.18%	1.22%	Apr-16	4.00%	2.62%	1.38%
May-00	8.70%	6.15%	2.55%	May-04	6.62%			May-08	6.28%	4.60%	1.68%	May-12	4.20%	2.93%	1.27%	May-16	3.93%	2.63%	1.30%
Jun-00	8.36%	5.93%	2.43%	Jun-04	6.46%			Jun-08	6.38%	4.69%	1.69%	Jun-12	4.08%	2.70%	1.38%	Jun-16	3.78%	2.45%	1.33%
Jul-00	8.25%	5.85%	2.40%	Jul-04	6.27%			Jul-08	6.40%	4.57%	1.83%	Jul-12	3.93%	2.59%	1.34%	Jul-16	3.57%	2.23%	1.34%
Aug-00	8.13%	5.72%	2.41%	Aug-04	6.14%			Aug-08	6.37%	4.50%	1.87%	Aug-12	4.00%	2.77%	1.23%	Aug-16	3.59%	2.26%	1.33%
Sep-00	8.23%	5.83%	2.40%	Sep-04	5.98%			Sep-08	6.49%	4.27%	2.22%	Sep-12	4.02%	2.88%	1.14%				
Oct-00	8.14%	5.80%	2.34%	Oct-04	5.94%			Oct-08	7.56%	4.17%	3.39%	Oct-12	3.91%	2.90%	1.01%				
Nov-00	8.11%	5.78%	2.33%	Nov-04	5.97%			Nov-08	7.60%	4.00%	3.60%	Nov-12	3.84%	2.80%	1.04%				
Dec-00	7.84%	5.49%	2.35%	Dec-04	5.92%			Dec-08	6.52%	2.87%	3.65%	Dec-12	4.00%	2.88%	1.12%	Average:			
Jan-01	7.80%	5.54%	2.26%	Jan-05	5.78%			Jan-09	6.39%	3.13%	3.26%	Jan-13	4.15%	3.08%	1.07%	12-months			1.39%
Feb-01	7.74%	5.45%	2.29%	Feb-05	5.61%			Feb-09	6.30%	3.59%	2.71%	Feb-13	4.18%	3.17%	1.01%	6-months			1.36%
Mar-01	7.68%	5.34%	2.34%	Mar-05	5.83%			Mar-09	6.42%	3.64%	2.78%	Mar-13	4.20%	3.16%	1.04%	3-months			1.33%
Apr-01	7.94%	5.65%	2.29%	Apr-05	5.64%			Apr-09	6.48%	3.76%	2.72%	Apr-13	4.00%	2.93%	1.07%				
May-01	7.99%	5.78%	2.21%	May-05	5.53%			May-09	6.49%	4.23%	2.26%	May-13	4.17%	3.11%	1.06%				
Jun-01	7.85%	5.67%	2.18%	Jun-05	5.40%			Jun-09	6.20%	4.52%	1.68%	Jun-13	4.53%	3.40%	1.13%				
Jul-01	7.78%	5.61%	2.17%	Jul-05	5.51%			Jul-09	5.97%	4.41%	1.56%	Jul-13	4.68%	3.61%	1.07%				
Aug-01	7.59%	5.48%	2.11%	Aug-05	5.50%			Aug-09	5.71%	4.37%	1.34%	Aug-13	4.73%	3.76%	0.97%				
Sep-01	7.75%	5.48%	2.27%	Sep-05	5.52%			Sep-09	5.53%	4.19%	1.34%	Sep-13	4.80%	3.79%	1.01%				
Oct-01	7.63%	5.32%	2.31%	Oct-05	5.79%			Oct-09	5.55%	4.19%	1.36%	Oct-13	4.70%	3.68%	1.02%				
Nov-01	7.57%	5.12%	2.45%	Nov-05	5.88%			Nov-09	5.64%	4.31%	1.33%	Nov-13	4.77%	3.80%	0.97%				
Dec-01	7.83%	5.48%	2.35%	Dec-05	5.80%			Dec-09	5.79%	4.49%	1.30%	Dec-13	4.81%	3.89%	0.92%				
Jan-02	7.66%	5.45%	2.21%	Jan-06	5.75%			Jan-10	5.77%	4.60%	1.17%	Jan-14	4.63%	3.77%	0.86%				
Feb-02	7.54%	5.40%	2.14%	Feb-06	5.82%	4.54%	1.28%	Feb-10	5.87%	4.62%	1.25%	Feb-14	4.53%	3.66%	0.87%				
Mar-02	7.76%			Mar-06	5.98%	4.73%	1.25%	Mar-10	5.84%	4.64%	1.20%	Mar-14	4.51%	3.62%	0.89%				
Apr-02	7.57%			Apr-06	6.29%	5.06%	1.23%	Apr-10	5.81%	4.69%	1.12%	Apr-14	4.41%	3.52%	0.89%				
May-02	7.52%			May-06	6.42%	5.20%	1.22%	May-10	5.50%	4.29%	1.21%	May-14	4.26%	3.39%	0.87%				
Jun-02	7.42%			Jun-06	6.40%	5.15%	1.25%	Jun-10	5.46%	4.13%	1.33%	Jun-14	4.29%	3.42%	0.87%				
Jul-02	7.31%			Jul-06	6.37%	5.13%	1.24%	Jul-10	5.26%	3.99%	1.27%	Jul-14	4.23%	3.33%	0.90%				
Aug-02	7.17%			Aug-06	6.20%	5.00%	1.20%	Aug-10	5.01%	3.80%	1.21%	Aug-14	4.13%	3.20%	0.93%				
Sep-02	7.08%			Sep-06	6.00%	4.85%	1.15%	Sep-10	5.01%	3.77%	1.24%	Sep-14	4.24%	3.26%	0.98%				
Oct-02	7.23%			Oct-06	5.98%	4.85%	1.13%	Oct-10	5.10%	3.87%	1.23%	Oct-14	4.06%	3.04%	1.02%				
Nov-02	7.14%			Nov-06	5.80%	4.69%	1.11%	Nov-10	5.37%	4.19%	1.18%	Nov-14	4.09%	3.04%	1.05%				
Dec-02	7.07%			Dec-06	5.81%	4.68%	1.13%	Dec-10	5.56%	4.42%	1.14%	Dec-14	3.95%	2.83%	1.12%				
Nov-02	7.14%	5.04%	2.10%	Nov-07	5.97%	4.56%	1.41%	Nov-12	3.84%	2.39%	1.45%								
Dec-02	7.07%	5.01%	2.06%	Dec-07	6.16%	4.57%	1.59%	Dec-12	4.00%	2.47%	1.53%								
Jan-03	7.07%	5.02%	2.05%	Jan-08	6.02%	4.35%	1.67%	Jan-13	4.15%	2.68%	1.47%								
Feb-03	6.93%	4.87%	2.06%	Feb-08	6.21%	4.49%	1.72%	Feb-13	4.18%	2.78%	1.40%								
Mar-03	6.79%	4.82%	1.97%	Mar-08	6.21%	4.36%	1.85%												
Apr-03	6.64%	4.91%	1.73%	Apr-08	6.29%	4.44%	1.85%												
May-03	6.36%	4.52%	1.84%	May-08	6.28%	4.60%	1.68%	Average:											
Jun-03	6.21%	4.34%	1.87%	Jun-08	6.38%	4.74%	1.64%	12-months			1.31%								
Jul-03	6.57%	4.92%	1.65%	Jul-08	6.40%	4.62%	1.78%	6-months			1.36%								
Aug-03	6.78%	5.39%	1.39%	Aug-08	6.37%	4.53%	1.84%	3-months			1.47%								
Sep-03	6.56%	5.21%	1.35%	Sep-08	6.49%	4.32%	2.17%												
Oct-03	6.43%	5.21%	1.22%	Oct-08	7.56%	4.45%	3.11%												
Nov-03	6.37%	5.17%	1.20%	Nov-08	7.60%	4.27%	3.33%												
Dec-03	6.27%	5.11%	1.16%	Dec-08	6.52%	3.18%	3.34%												

Common Equity Risk Premiums
Years 1926-2015

	Large Common Stocks	Long-Term Corp. Bonds	Equity Risk Premium	Long-Term Govt. Bonds Yields
Low Interest Rates	11.97%	4.85%	7.12%	2.97%
Average Across All Interest Rates	11.95%	6.30%	5.65%	5.09%
High Interest Rates	11.93%	7.75%	4.18%	7.22%

Source of Information: 2016 SBBI Yearbook Stocks, Bonds, Bills, and Inflation

Basic Series
Annual Total Returns (except yields)

Year	Large Common Stocks	Long-Term Corp. Bonds	Long-Term Govt. Bonds Yields
1940	-9.78%	3.39%	1.94%
1945	36.44%	4.08%	1.99%
1941	-11.59%	2.73%	2.04%
1949	18.79%	3.31%	2.09%
1946	-8.07%	1.72%	2.12%
1950	31.71%	2.12%	2.24%
1939	-0.41%	3.97%	2.26%
1948	5.50%	4.14%	2.37%
1947	5.71%	-2.34%	2.43%
1942	20.34%	2.60%	2.46%
1944	19.75%	4.73%	2.46%
2012	16.00%	10.68%	2.46%
2014	13.69%	17.28%	2.46%
1943	25.90%	2.83%	2.48%
1938	31.12%	6.13%	2.52%
1936	33.92%	6.74%	2.55%
2011	2.11%	17.95%	2.55%
2015	1.38%	-1.02%	2.68%
1951	24.02%	-2.69%	2.69%
1954	52.62%	5.39%	2.72%
1937	-35.03%	2.75%	2.73%
1953	-0.99%	3.41%	2.74%
1935	47.67%	9.61%	2.76%
1952	18.37%	3.52%	2.79%
1934	-1.44%	13.84%	2.93%
1955	31.56%	0.48%	2.95%
2008	-37.00%	8.78%	3.03%
1932	-8.19%	10.82%	3.15%
1927	37.49%	7.44%	3.17%
1957	-10.78%	8.71%	3.23%
1930	-24.90%	7.98%	3.30%
1933	53.99%	10.38%	3.36%
1928	43.61%	2.84%	3.40%
1929	-8.42%	3.27%	3.40%
1956	6.56%	-6.81%	3.45%
1926	11.62%	7.37%	3.54%
2013	32.39%	-7.07%	3.78%
1960	0.47%	9.07%	3.80%
1958	43.36%	-2.22%	3.82%
1962	-8.73%	7.95%	3.95%
1931	-43.34%	-1.85%	4.07%
2010	15.06%	12.44%	4.14%
1961	26.89%	4.82%	4.15%
1963	22.80%	2.19%	4.17%
1964	16.48%	4.77%	4.23%
1959	11.96%	-0.97%	4.47%
1965	12.45%	-0.46%	4.50%
2007	5.49%	2.60%	4.50%
1966	-10.06%	0.20%	4.55%
2009	26.46%	3.02%	4.58%
2005	4.91%	5.87%	4.61%
2002	-22.10%	16.33%	4.84%
2004	10.88%	8.72%	4.84%
2006	15.79%	3.24%	4.91%
2003	28.68%	5.27%	5.11%
1998	28.58%	10.76%	5.42%
1967	23.98%	-4.95%	5.56%
2000	-9.10%	12.87%	5.58%
2001	-11.89%	10.65%	5.75%
1971	14.30%	11.01%	5.97%
1968	11.06%	2.57%	5.98%
1972	18.99%	7.26%	5.99%
1997	33.36%	12.95%	6.02%
1995	37.58%	27.20%	6.03%
1970	3.86%	18.37%	6.48%
1993	10.08%	13.19%	6.54%
1996	22.96%	1.40%	6.73%
1999	21.04%	-7.45%	6.82%
1969	-8.50%	-8.09%	6.87%
1976	23.93%	18.65%	7.21%
1973	-14.69%	1.14%	7.26%
1992	7.62%	9.39%	7.26%
1991	30.47%	19.89%	7.30%
1974	-26.47%	-3.06%	7.60%
1986	18.67%	19.85%	7.89%
1994	1.32%	-5.76%	7.99%
1977	-7.16%	1.71%	8.03%
1975	37.23%	14.64%	8.05%
1989	31.69%	16.23%	8.16%
1990	-3.10%	6.78%	8.44%
1978	6.57%	-0.07%	8.98%
1988	16.61%	10.70%	9.19%
1987	5.25%	-0.27%	9.20%
1985	31.73%	30.09%	9.56%
1979	18.61%	-4.18%	10.12%
1982	21.55%	42.56%	10.95%
1984	6.27%	16.86%	11.70%
1983	22.56%	6.26%	11.97%
1980	32.50%	-2.76%	11.99%

Yields for Treasury Constant Maturities
Yearly for 2011-2015
and the Twelve Months Ended August 2016

Years	1-Year	2-Year	3-Year	5-Year	7-Year	10-Year	20-Year	30-Year
2011	0.18%	0.45%	0.75%	1.52%	2.16%	2.78%	3.62%	3.91%
2012	0.17%	0.28%	0.38%	0.76%	1.22%	1.80%	2.54%	2.92%
2013	0.13%	0.31%	0.54%	1.17%	1.74%	2.35%	3.12%	3.45%
2014	0.12%	0.46%	0.90%	1.64%	2.14%	2.54%	3.07%	3.34%
2015	0.32%	0.69%	1.03%	1.53%	1.89%	2.14%	2.55%	2.84%
Five-Year Average	0.18%	0.44%	0.72%	1.32%	1.83%	2.32%	2.98%	3.29%

Months	1-Year	2-Year	3-Year	5-Year	7-Year	10-Year	20-Year	30-Year
Sep-15	0.37%	0.71%	1.01%	1.49%	1.88%	2.17%	2.62%	2.95%
Oct-15	0.26%	0.64%	0.93%	1.39%	1.76%	2.07%	2.50%	2.89%
Nov-15	0.48%	0.88%	1.20%	1.67%	2.02%	2.26%	2.69%	3.03%
Dec-15	0.65%	0.98%	1.28%	1.70%	2.04%	2.24%	2.61%	2.97%
Jan-16	0.54%	0.90%	1.14%	1.52%	1.85%	2.09%	2.49%	2.86%
Feb-16	0.53%	0.73%	0.90%	1.22%	1.53%	1.78%	2.20%	2.62%
Mar-16	0.66%	0.88%	1.04%	1.38%	1.68%	1.89%	2.28%	2.68%
Apr-16	0.56%	0.77%	0.92%	1.26%	1.57%	1.81%	2.21%	2.62%
May-16	0.59%	0.82%	0.97%	1.30%	1.60%	1.81%	2.22%	2.63%
Jun-16	0.55%	0.73%	0.86%	1.17%	1.44%	1.64%	2.02%	2.45%
Jul-16	0.51%	0.67%	0.79%	1.07%	1.33%	1.50%	1.82%	2.23%
Aug-16	0.57%	0.74%	0.85%	1.13%	1.40%	1.56%	1.89%	2.26%
Twelve-Month Average	0.52%	0.79%	0.99%	1.36%	1.68%	1.90%	2.30%	2.68%
Six-Month Average	0.57%	0.77%	0.91%	1.22%	1.50%	1.70%	2.07%	2.48%
Three-Month Average	0.54%	0.71%	0.83%	1.12%	1.39%	1.57%	1.91%	2.31%

Source: Federal Reserve statistical release H.15

Measures of the Risk-Free Rate & Corporate Bond Yields
The forecast of Treasury and Corporate yields
per the consensus of nearly 50 economists
reported in the Blue Chip Financial Forecasts dated September 1, 2016

		Treasury					Corporate	
Year	Quarter	1-Year Bill	2-Year Note	5-Year Note	10-Year Note	30-Year Bond	Aaa Bond	Baa Bond
2016	Third	0.6%	0.7%	1.1%	1.5%	2.3%	3.3%	4.4%
2016	Fourth	0.7%	0.9%	1.3%	1.7%	2.5%	3.6%	4.6%
2017	First	0.9%	1.1%	1.5%	1.9%	2.6%	3.8%	4.8%
2017	Second	1.1%	1.2%	1.6%	2.1%	2.8%	3.9%	4.9%
2017	Third	1.2%	1.4%	1.8%	2.2%	2.9%	4.1%	5.0%
2017	Fourth	1.4%	1.6%	2.0%	2.4%	3.1%	4.2%	5.2%

Measures of the Market Premium

Value Line Return

As of:	Dividend Yield		Median Appreciation Potential		Median Total Return
26-Aug-16	2.2%	+	8.78%	=	10.98%

DCF Result for the S&P 500 Composite

D/P	(1+.5g)	+	g	=	k
2.08%	(1.0420)	+	8.40%	=	10.57%

where:	Price (P)	at	31-Aug-16	=	2170.95
	Dividend (D)	for	2nd Qtr. '16	=	11.28
	Dividend (D)		annualized	=	45.12
	Growth (g)	by	Morningstar	=	8.40%

Summary

Value Line	10.98%
S&P 500	10.57%
Average	10.78%
Risk-free Rate of Return (Rf)	3.25%
Forecast Market Premium	7.53%

Historical Market Premium	(Rm)	(Rf)	
1926-2015 Arith. mean	11.96%	4.03%	7.93%

Average - Forecast/Historical	7.73%

Exhibit 7.8: Size-Decile Portfolios of the NYSE/NYSE MKT/NASDAQ Long-Term Returns in Excess of CAPM
1926–2015

Size Grouping	OLS Beta	Arithmetic Mean	Return in Excess of Risk-free Rate (actual)	Return in Excess of Risk-free Rate (as predicted by CAPM)	Size Premium
Mid-Cap (3–5)	1.12	13.80%	8.75%	7.75%	1.00%
Low-Cap (6–8)	1.22	15.19%	10.14%	8.44%	1.70%
Micro-Cap (9–10)	1.35	17.93%	12.88%	9.31%	3.58%
Breakdown of Deciles 1–10					
1-Largest	0.92	11.05%	6.00%	6.36%	-0.36%
2	1.04	12.78%	7.73%	7.16%	0.57%
3	1.10	13.53%	8.49%	7.63%	0.86%
4	1.12	13.80%	8.75%	7.76%	0.99%
5	1.17	14.59%	9.54%	8.05%	1.49%
6	1.17	14.77%	9.72%	8.09%	1.63%
7	1.25	15.29%	10.25%	8.62%	1.62%
8	1.30	16.08%	11.03%	8.99%	2.04%
9	1.34	16.81%	11.77%	9.23%	2.54%
10-Smallest	1.39	20.26%	15.21%	9.61%	5.60%

Betas are estimated from monthly returns in excess of the 30-day U.S. Treasury bill total return, January 1926–December 2015. Historical riskless rate measured by the 90-year arithmetic mean income return component of 20-year government bonds (5.05%). Calculated in the context of the CAPM by multiplying the equity risk premium by beta. The equity risk premium is estimated by the arithmetic mean total return of the S&P 500 (11.95%) minus the arithmetic mean income return component of 20-year government bonds (5.05%) from 1926–2015. Source: Morningstar *Direct* and CRSP. Calculated based on data from CRSP US Stock Database and CRSP US Indices Database ©2016 Center for Research. Used with permission. All calculations performed by Duff & Phelps LLC.

Comparable Earnings Approach
Using Non-Utility Companies with
Timeliness of 1, 2 & 3; Safety Rank of 1, 2 & 3; Financial Strength of B++, A & A+;
Price Stability of 85 to 100; Betas of .60 to .80; and Technical Rank of 1& 2

Company	Industry	Timeliness Rank	Safety Rank	Financial Strength	Price Stability	Beta	Technical Rank
Campbell Soup Co	Food Processing	2	2	B++	95	0.65	2
Clorox Co	Household Products	2	2	B++	100	0.65	2
Costco Wholesale Corporation	Retail Store	3	1	A+	100	0.75	1
Dr Pepper Snapple Group Inc	Beverage	3	2	A	100	0.70	2
General Mills Inc	Food Processing	3	1	A+	100	0.70	2
Hershey Company	Food Processing	3	2	B++	95	0.70	1
Kellogg Company	Food Processing	2	1	A	100	0.65	1
McCormick and Co	Food Processing	1	1	A+	100	0.75	2
O Reilly Automotive Inc	Retail Automotive	3	2	A	85	0.75	2
Progressive Corporation	Insurance (Prop/Cas.)	3	2	B++	95	0.80	1
Sysco Corp	Retail/Wholesale Food	2	1	A+	100	0.75	2
Waste Connections	Environmental	3	2	B++	90	0.75	2
Waste Management	Environmental	2	1	A	100	0.75	2
Average		2	2	A	97	0.72	2
Gas Group	Average	2	2	A	91	0.73	1

Source of Information: Value Line Investment Survey for Windows, September 2016

Comparable Earnings Approach
Five -Year Average Historical Earned Returns
for Years 2011-2015 and
Projected 3-5 Year Returns

Company	2011	2012	2013	2014	2015	Average	Projected 2019-21
Campbell Soup Co	77.8%	87.2%	64.6%	49.5%	60.2%	67.9%	29.0%
Clorox Co	-	-	NMF	NMF	NMF	-	NMF
Costco Wholesale Corporation	12.2%	14.1%	18.2%	16.7%	22.0%	16.6%	21.5%
Dr Pepper Snapple Group Inc	26.8%	26.9%	26.5%	30.6%	35.0%	29.2%	31.5%
General Mills Inc	26.0%	26.6%	26.8%	27.9%	35.3%	28.5%	33.0%
Hershey Company	76.4%	71.4%	52.6%	61.6%	91.2%	70.6%	43.5%
Kellogg Company	69.9%	53.6%	38.9%	50.1%	59.1%	54.3%	38.0%
McCormick and Co	23.1%	24.0%	21.5%	24.4%	26.9%	24.0%	23.0%
O Reilly Automotive Inc	18.4%	27.8%	34.1%	38.6%	47.5%	33.3%	31.0%
Progressive Corporation	16.5%	11.7%	14.8%	16.5%	15.2%	14.9%	18.0%
Sysco Corp	24.5%	23.9%	19.1%	17.7%	20.9%	21.2%	55.5%
Waste Connections	12.1%	9.3%	10.0%	10.6%	11.4%	10.7%	10.0%
Waste Management	16.6%	15.2%	17.7%	19.7%	21.6%	18.2%	28.0%
Average						32.5%	30.2%
Median						26.3%	30.0%
Average (excluding companies with values >20%)						15.1%	14.0%

Comparable Earnings Approach
Screening Parameters

Timeliness Rank

The rank for a stock's probable relative market performance in the year ahead. Stocks ranked 1 (Highest) or 2 (Above Average) are likely to outpace the year-ahead market. Those ranked 4 (Below Average) or 5 (Lowest) are not expected to outperform most stocks over the next 12 months. Stocks ranked 3 (Average) will probably advance or decline with the market in the year ahead. Investors should try to limit purchases to stocks ranked 1 (Highest) or 2 (Above Average) for Timeliness.

Safety Rank

A measure of potential risk associated with individual common stocks rather than large diversified portfolios (for which Beta is good risk measure). Safety is based on the stability of price, which includes sensitivity to the market (see Beta) as well as the stock's inherent volatility, adjusted for trend and other factors including company size, the penetration of its markets, product market volatility, the degree of financial leverage, the earnings quality, and the overall condition of the balance sheet. Safety Ranks range from 1 (Highest) to 5 (Lowest). Conservative investors should try to limit purchases to equities ranked 1 (Highest) or 2 (Above Average) for Safety.

Financial Strength

The financial strength of each of the more than 1,600 companies in the VS II data base is rated relative to all the others. The ratings range from A++ to C in nine steps. (For screening purposes, think of an A rating as "greater than" a B). Companies that have the best relative financial strength are given an A++ rating, indicating ability to weather hard times better than the vast majority of other companies. Those who don't quite merit the top rating are given an A+ grade, and so on. A rating as low as C++ is considered satisfactory. A rating of C+ is well below average, and C is reserved for companies with very serious financial problems. The ratings are based upon a computer analysis of a number of key variables that determine (a) financial leverage, (b) business risk, and (c) company size, plus the judgment of Value Line's analysts and senior editors regarding factors that cannot be quantified across-the-board for companies. The primary variables that are indexed and studied include equity coverage of debt, equity coverage of intangibles, "quick ratio", accounting methods, variability of return, fixed charge coverage, stock price stability, and company size.

Price Stability Index

An index based upon a ranking of the weekly percent changes in the price of the stock over the last five years. The lower the standard deviation of the changes, the more stable the stock. Stocks ranking in the top 5% (lowest standard deviations) carry a Price Stability Index of 100; the next 5%, 95; and so on down to 5. One standard deviation is the range around the average weekly percent change in the price that encompasses about two thirds of all the weekly percent change figures over the last five years. When the range is wide, the standard deviation is high and the stock's Price Stability Index is low.

Beta

A measure of the sensitivity of the stock's price to overall fluctuations in the New York Stock Exchange Composite Average. A Beta of 1.50 indicates that a stock tends to rise (or fall) 50% more than the New York Stock Exchange Composite Average. Use Beta to measure the stock market risk inherent in any diversified portfolio of, say, 15 or more companies. Otherwise, use the Safety Rank, which measures total risk inherent in an equity, including that portion attributable to market fluctuations. Beta is derived from a least squares regression analysis between weekly percent changes in the price of a stock and weekly percent changes in the NYSE Average over a period of five years. In the case of shorter price histories, a smaller time period is used, but two years is the minimum. The Betas are periodically adjusted for their long-term tendency to regress toward 1.00.

Technical Rank

A prediction of relative price movement, primarily over the next three to six months. It is a function of price action relative to all stocks followed by Value Line. Stocks ranked 1 (Highest) or 2 (Above Average) are likely to outpace the market. Those ranked 4 (Below Average) or 5 (Lowest) are not expected to outperform most stocks over the next six months. Stocks ranked 3 (Average) will probably advance or decline with the market. Investors should use the Technical and Timeliness Ranks as complements to one another.