Consolidated Edison Company of New York, INC.

Electric Rate Case

INDEX OF EXHIBITS

Volume 2

Earnings Insight

FACTSET

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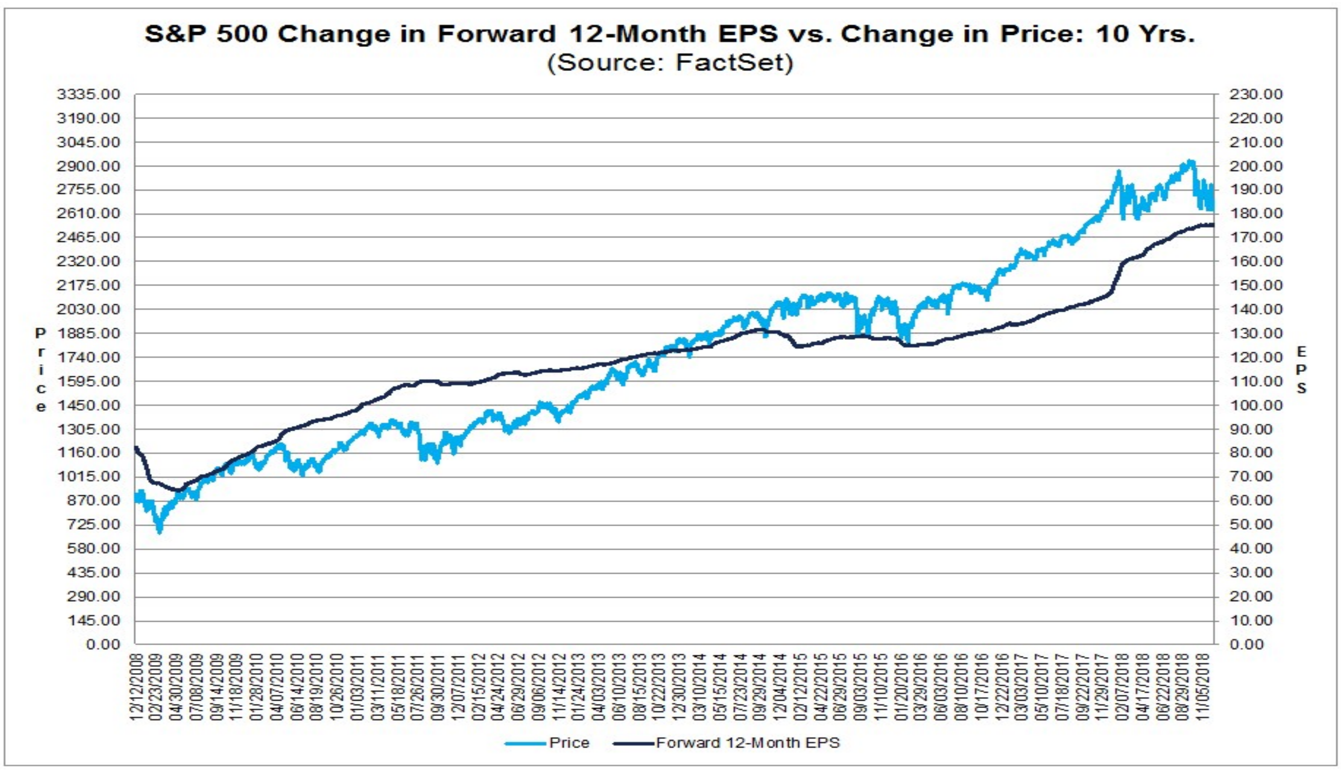
December 14, 2018

Key Metrics

- **Earnings Growth:** For Q4 2018, the estimated earnings growth rate for the S&P 500 is 12.8%. If 12.8% is the actual growth rate for the quarter, it will mark the fifth straight quarter of double-digit earnings growth for the index.
- **Earnings Revisions:** On September 30, the estimated earnings growth rate for Q4 2018 was 16.7%. All eleven sectors have lower growth rates today (compared to September 30) due to downward revisions to EPS estimates.
- **Earnings Guidance:** For Q4 2018, 71 S&P 500 companies have issued negative EPS guidance and 33 S&P 500 companies have issued positive EPS guidance.
- **Valuation:** The forward 12-month P/E ratio for the S&P 500 is 15.1. This P/E ratio is below the 5-year average (16.4) but above the 10-year average (14.6).
- **Earnings Scorecard:** For Q4 2018 (with 3 companies in the S&P 500 reporting actual results for the quarter), 1 S&P 500 company has reported a positive EPS surprise and 2 companies have reported a positive sales surprise.



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Topic of the Week: 1

Where Are Analysts Most Optimistic on Ratings for S&P 500 Companies For 2019?

With the end of the year approaching, where are analysts most optimistic and pessimistic in terms of their ratings on stocks in the S&P 500? How have their views changed over the past few months?

Overall, there are 11,136 ratings on stocks in the S&P 500. Of these 11,136 ratings, 53.9% are Buy ratings, 40.8% are Hold ratings, and 5.3% are Sell ratings.

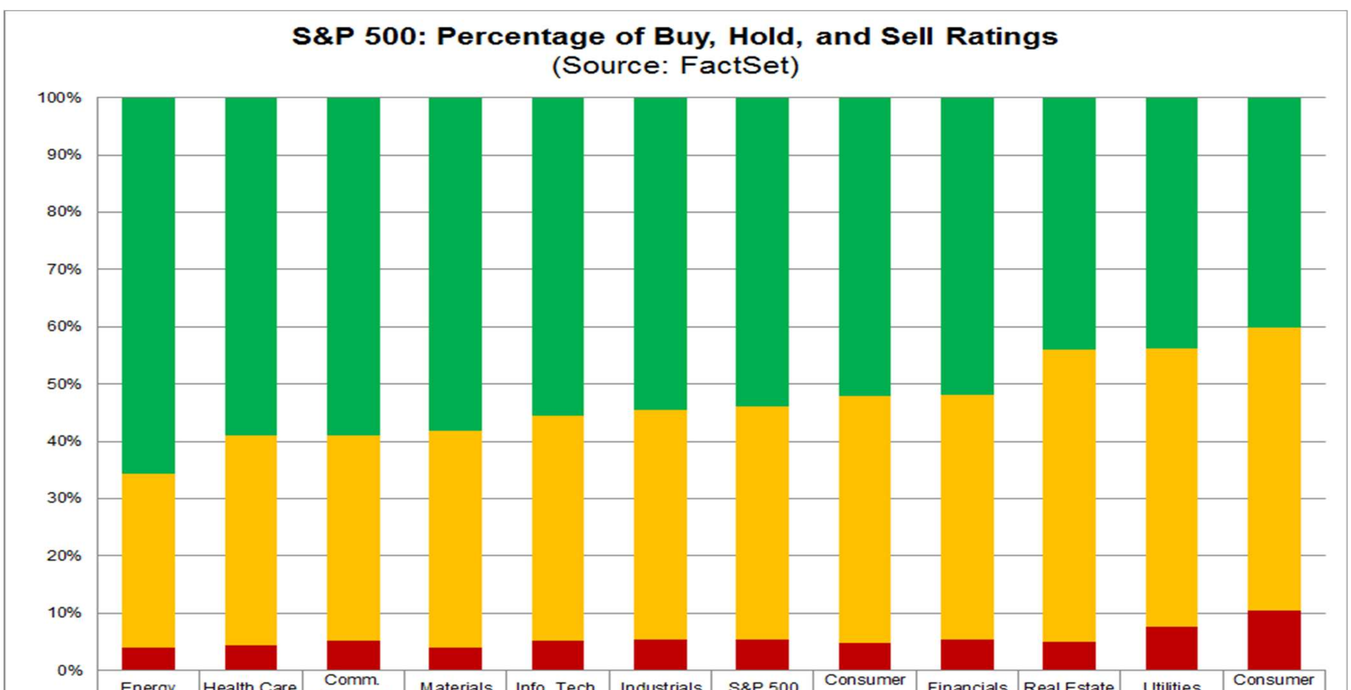
At the sector level, analysts are most optimistic on the Energy (66%), Health Care (59%), Communication Services (59%), and Materials (58%) sectors, as these four sectors have highest percentages of Buy ratings.

On the other hand, analysts are most pessimistic about the Consumer Staples (40%), Utilities (44%), and Real Estate (44%) sectors, as these three sectors have the lowest percentage of Buy ratings. The Real Estate sector also has the highest percentage of Hold ratings (51%), while the Consumer Staples sector has the highest percentage of Sell ratings (10%).

At the company level, the ten stocks in the S&P 500 with the highest percentages of Buy ratings and the highest percentages of Sell ratings are listed on the next page.

Since September 30, the total number of ratings on S&P 500 companies has increased by 1.6% (to 11,136 from 10,957).

The number of Buy ratings has increased by 4.2% (to 6,001 from 5,757). Ten sectors have witnessed an increase in Buy ratings, led by the Energy (+18%) sector. The Consumer Staples (-7%) sector is the only sector that has seen a decrease in Buy ratings. The number of Hold ratings has decreased by 0.6% (to 4,543 from 4,569). Seven sectors have recorded a decrease in Hold ratings, led by the Energy (-11%) sector. Four sectors have witnessed an increase in Hold ratings, led by the Information Technology (+11%) sector. The number of Sell ratings has decreased by 6.2% (to 592 from 631). Seven sectors have a recorded a decrease in Sell ratings, led by the Communication Services (-25%), Consumer Discretionary (-19%), and Energy (-13%) sectors. Three sectors have seen an increase in Sell ratings, led by the Real Estate (+15%) sector.



	Energy	Health Care	Comm. Services	Materials	Info. Tech.	Industrials	S&P 500	Consumer Disc.	Financials	Real Estate	Utilities	Consumer Staples
Buy	66%	59%	59%	58%	55%	55%	54%	52%	52%	44%	44%	40%
Hold	30%	37%	36%	38%	39%	40%	41%	43%	43%	51%	49%	49%
Sell	4%	4%	5%	4%	5%	5%	5%	5%	5%	5%	8%	10%

Highest Buy Ratings % in S&P 500: Top 10 (Source: FactSet)

Company	**Buy**	Hold	Sell	Total
Marathon Petroleum Corporation	**100%**	0%	0%	100%
Keysight Technologies Inc	**100%**	0%	0%	100%
Jefferies Financial Group Inc.	**100%**	0%	0%	100%
Amazon.com, Inc.	**98%**	2%	0%	100%
LKQ Corporation	**94%**	6%	0%	100%
Diamondback Energy, Inc.	**94%**	6%	0%	100%
E*TRADE Financial Corporation	**94%**	6%	0%	100%
Alphabet Inc. Class A	**93%**	7%	0%	100%
Alphabet Inc. Class C	**93%**	7%	0%	100%
Pioneer Natural Resources Co.	**93%**	7%	0%	100%

Highest Sell Ratings % in S&P 500: Top 10 (Source: FactSet)

Company	Buy	Hold	**Sell**	Total
Public Storage	6%	47%	**47%**	100%
Torchmark Corporation	18%	36%	**45%**	100%
Campbell Soup Company	17%	39%	**44%**	100%
Robert Half International Inc.	29%	36%	**36%**	100%
Southern Company	24%	43%	**33%**	100%
Franklin Resources, Inc.	0%	67%	**33%**	100%
Omnicom Group Inc	20%	47%	**33%**	100%
Consolidated Edison, Inc.	5%	63%	**32%**	100%
Expeditors Intl. of Washington, Inc.	13%	56%	**31%**	100%
Western Union Company	17%	52%	**30%**	100%

Topic of the Week: 2

S&P 500 Companies with Lowest % of Buy Ratings Are Top Performers in 2018

At the start of this year (December 31, 2017), there were 11,147 ratings on stocks in the S&P 500. Of these 11,147 ratings, 49.5% were Buy ratings, 45.3% were Hold ratings, and 5.2% were Sell ratings. How have analysts performed in terms of their Buy ratings on S&P 500 companies in 2018?

To analyze the performance, FactSet divided the stocks that were in the S&P 500 on December 31, 2017 into five equal-sized groups (quintiles) based on the percentage of Buy ratings at the start of the year (December 31, 2017). The 20% of S&P 500 companies with the highest percentage of Buy ratings were placed in the first group (Quintile 1). The 20% of S&P 500 companies with next highest percentage of Buy ratings were placed in the second group (Quintile 2). The 20% of S&P 500 companies with the lowest percentage of Buy ratings were placed in the last group (Quintile 5). FactSet then looked at the average total return and median total return for each group from December 31, 2017 through December 13, 2018 to measure performance. For companies that no longer were traded publicly as of December 13, the last available trading price was used in the analysis when available.

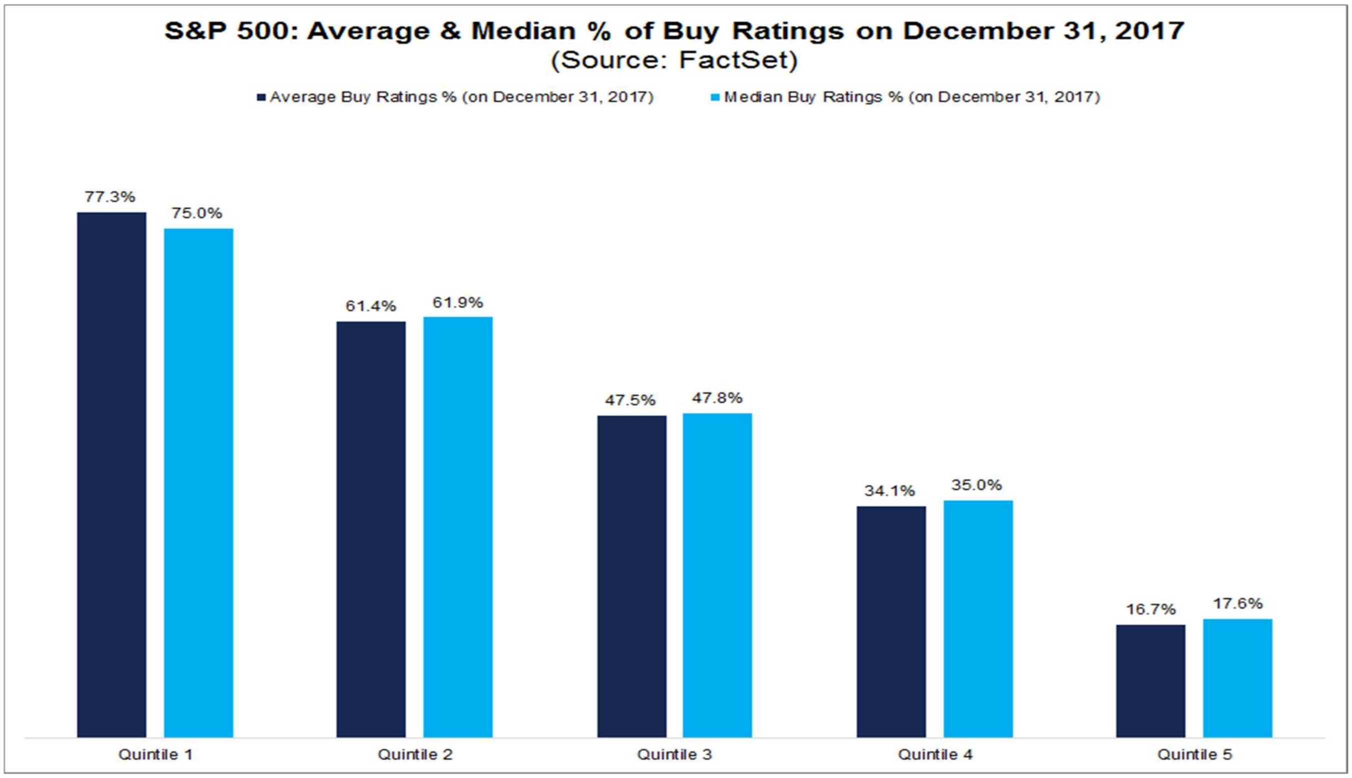
The quintile with the 20% of S&P 500 stocks with the lowest percentage of Buy ratings (Quintile 5) at the start of the year has recorded the highest average total return (+3.6%) and the highest median total return (+4.3%) to date of the five quintiles. In fact, this quintile is the only quintile to report a positive average total return and positive median total return during this period. The remaining four quintiles have all reported negative average and median totals returns since the start of the year. The average percentage of Buy ratings for a stock in the fifth quintile was 16.7%, while the median percentage of Buy ratings for a stock in the fifth quintile was 17.6%.

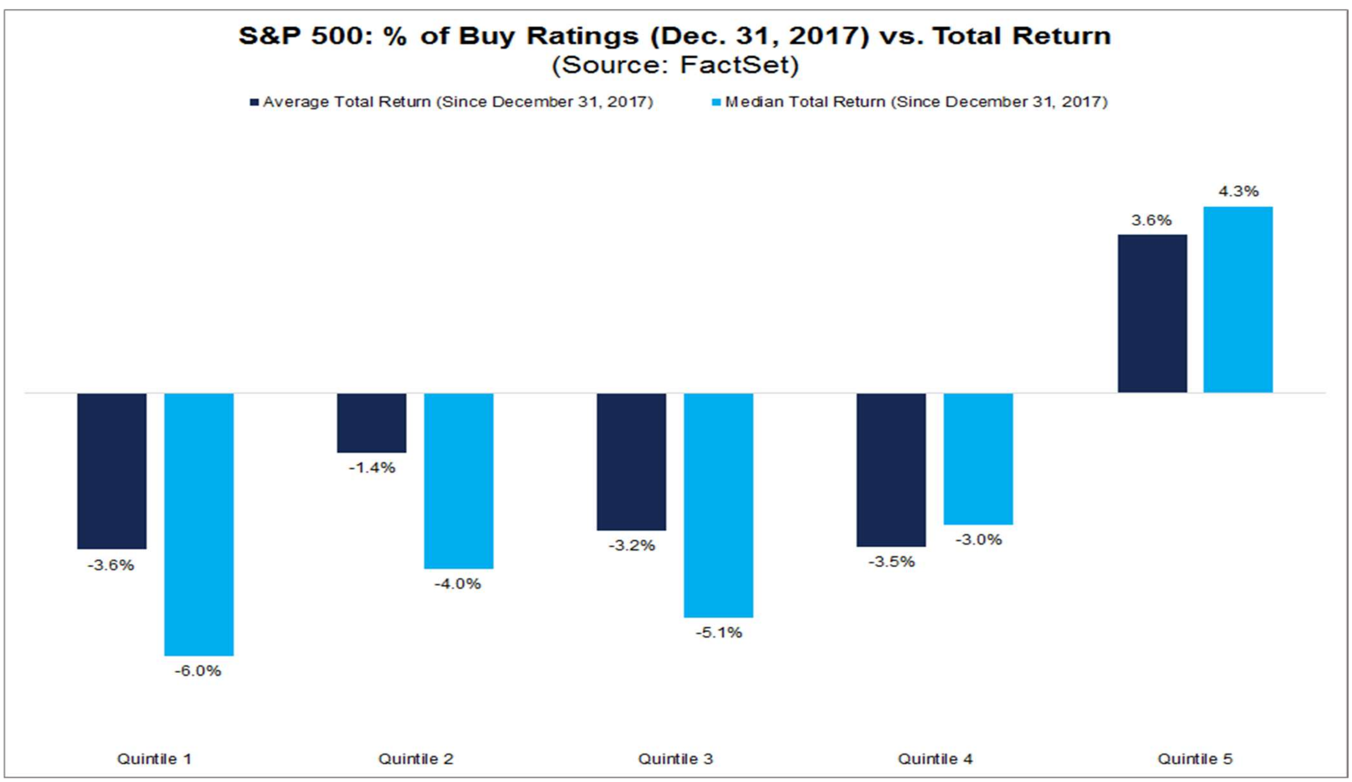
Of the stocks in this group, TripAdvisor has been the best performer to date. The price return and total return for TripAdvisor from December 31, 2017 through December 13, 2018 is 78.1%. The price of the stock has increased to $61.39 from $34.46 during this period. On December 31, 2017, 2 of the 26 ratings (8%) on TripAdvisor were Buy ratings. Other top performers in this quintile include Chipotle Mexican Grille, McCormick & Company, Under Armour, and Macy's.

The quintile with the 20% of S&P 500 stocks with the highest percentage of Buy ratings (Quintile 1) at the start of the year has recorded the lowest average total return (-3.6%) and the lowest median total return (-6.0%) of the five quintiles to date. The average percentage of Buy ratings for a stock in this quintile was 77.3%, while the median percentage of Buy ratings for a stock in this quintile was 75.0%.

Of the stocks in this group, Mohawk Industries has been the worst performer to date. The price return and total return for Mohawk Industries from December 31, 2017 through December 13, 2018 is -57.2%. The price of the stock has decreased to $118.20 from $275.90 during this period. On December 31, 2017, 18 of the 23 ratings (77%) on Mohawk Industries were Buy ratings. Other bottom performers in this quintile include Western Digital, Halliburton, Kraft Heinz, and Applied Materials.

It is interesting to note that in 2017, the 20% of S&P 500 companies with the highest percentage of Buy ratings at the start of the year were the top performers for the year and the 20% of S&P 500 companies with lowest percentage of Buy ratings at the start of the year were the worst performers. For more details on 2017, please see this article: https://insight.factset.com/sp-500-companies-with-highest-of-buy-ratings-are-top-performers-in-2017


S&P 500: Average & Median % of Buy Ratings on December 31, 2017
(Source: FactSet)
Average Buy Ratings % (on December 31, 2017)
Median Buy Ratings % (on December 31, 2017)
77.3%
75.0%
61.4%
61.9%
47.5%
47.8%
34.1%
35.0%
16.7%
17.6%
Quintile 1
Quintile 2
Quintile 3
Quintile 4
Quintile 5


S&P 500: % of Buy Ratings (Dec. 31, 2017) vs. Total Return
(Source: FactSet)
Average Total Return (Since December 31, 2017)
Median Total Return (Since December 31, 2017)
-3.6%
-6.0%
-1.4%
-4.0%
-3.2%
-5.1%
-3.5%
-3.0%
3.6%
4.3%
Quintile 1
Quintile 2
Quintile 3
Quintile 4
Quintile 5

Q4 Earnings Season: By The Numbers

Overview

In terms of estimate revisions for companies in the S&P 500, analysts have reduced EPS estimates within average levels for Q4 2018 to date. On a per-share basis, estimated earnings for the fourth quarter have fallen by 3.2% since September 30. This percentage decline is larger than the 5-year average (-3.1%) for a quarter, but smaller than the10-year average (-4.5%) and the 15-year average (-3.9%) for this period.

In addition, slightly fewer S&P 500 companies have lowered the bar for earnings for Q4 2018 relative to recent quarters. Of the 104 companies that have issued EPS guidance for the fourth quarter, 71 have issued negative EPS guidance and 33 have issued positive EPS guidance. The percentage of companies issuing negative EPS guidance is 68% (71 out of 104), which is slightly below the 5-year average of 70%.

Because of the net downward revisions to earnings estimates, the estimated year-over-year earnings growth rate for Q4 2018 has decreased to 12.8% today from 16.7% on September 30. All eleven sectors are predicted to report year-over-year earnings growth. Six sectors are projected to report double-digit growth in earnings for the quarter, led by the Energy, Financials, and Industrials sectors.

Because of net downward revisions to revenue estimates, the estimated year-over-year revenue growth rate for Q4 2018 has decreased to 6.5% today from 6.8% on September 30. Ten of the eleven sectors are projected to report year-over-year growth in revenues. Four sectors are predicted to report double-digit growth in revenues: Communication Services, Energy, Real Estate, and Materials.

Looking at future quarters, analysts see single-digit earnings growth for the first three quarters of 2019.

The forward 12-month P/E ratio is 15.1, which is below the 5-year average but above the 10-year average.

During the upcoming week, 14 S&P 500 companies (including 2 Dow 30 components) are scheduled to report results for the fourth quarter.

Earnings Revisions: Largest Declines in Energy, Utilities, and Materials Sectors

Decline in Estimated Earnings Growth Rate for Q4 This Week

The estimated earnings growth rate for the fourth quarter is 12.8% this week, which is below the estimated earnings growth rate of 13.2% last week. Downward revisions to estimates for companies in the Energy and Financials sectors were mainly responsible for the decrease in the overall growth rate during the week.

The estimated earnings growth rate for Q4 2018 of 12.8% today is below the estimated earnings growth rate of 16.7% at the start of the quarter (September 30). All eleven sectors have a recorded a decrease in expected earnings growth due to downward revisions to earnings estimates, led by the Energy, Utilities, and Materials sectors.

Energy: Exxon Mobil Leads Decline

The Energy sector has recorded the largest decrease in expected earnings growth since the start of the quarter (to 85.4% from 95.4%). This sector has also witnessed the largest decrease in price since September 30 at -16.7%. Overall, 17 of the 30 companies (57%) in the Energy sector have seen a decrease in their mean EPS estimate during this time. Of these 17 companies, 9 have recorded a decrease in their mean EPS estimate of more than 10%, led by National Oilwell Varco (to $0.09 from $0.16) and Valero Energy (to $0.95 from $1.50). However, Exxon Mobil (to $1.21 from $1.36) has been the largest contributor to the decrease in earnings for this sector. The stock price for this company has fallen by 10.1% since September 30.

Utilities: 86% of Companies Have Seen a Decline in Earnings Expectations

The Utilities sector has recorded the second largest decrease in expected earnings growth since the start of the quarter (to 1.4% from 10.2%). Despite the decline in expected earnings, this sector has witnessed the largest increase in price since September 30 at 7.4%. Overall, 25 of the 29 companies (86%) in the Utilities sector have seen a decrease in their mean EPS estimate during this time. Of these 25 companies, 10 have recorded a decrease in their mean EPS estimate of more than 10%, led by NRG Energy (to $0.15 from $0.28), Entergy, (to $0.46 from $0.86), Evergy (to $0.21 from $0.35), SCANA (to $0.44 from $0.70), and Pinnacle West Capital (to $0.19 from $0.30).

Materials: 75% of Companies Have Seen a Decline in Earnings Expectations

The Materials sector has recorded the third largest decrease in expected earnings growth since the start of the quarter (to 9.6% from 17.6%). This sector has also witnessed a decrease in price of 11.2% since September 30. Overall, 18 of the 24 companies (75%) in the Materials sector have seen a decrease in their mean EPS estimate during this time. Of these 18 companies, 7 have recorded a decrease in their mean EPS estimate of more than 10%, led by Freeport McMoRan (to $0.22 from $0.33), Martin Marietta Materials, (to $1.86 from $2.58), WestRock Company (to $0.84 from $1.13), and Newmont Mining (to $0.25 from $0.33).

Industrials: GE Leads Decline

The Industrials sector has recorded the fourth largest decrease in expected earnings growth since the start of the quarter (to 14.5% from 20.7%). This sector has also witnessed the second largest decrease in price since September 30 at -13.6%. Overall, 42 of the 69 companies (61%) in the Industrials sector have seen a decrease in their mean EPS estimate during this time. Of these 42 companies, 7 have recorded a decrease in their mean EPS estimate of more than 10%, led by General Electric (to $0.22 from $0.36), Johnson Controls (to $0.37 from $0.60), Fluor (to $0.61 from $0.84), and Alaska Air Group (to $0.62 from $0.79). General Electric has also been the largest contributor to the decrease in earnings for this sector. The stock price for this company has fallen by 36.7% since September 30.

Index-Level (Bottom-Up) EPS Estimate: Average Decline to Date

The Q4 bottom-up EPS estimate (which is an aggregation of the median earnings estimates for all 500 companies in the index and can be used as a proxy for the earnings for the index) has decreased by 3.2% (to $41.18 from $42.56) since September 30. This percentage decline is larger than the 5-year average (-3.1%) for a quarter, but smaller than the 10-year average (-4.5%) and the 15-year average (-3.9%) for a quarter.

Guidance: Below Average % of S&P 500 Companies Issuing Negative EPS Guidance for Q4

The term “guidance” (or “preannouncement”) is defined as a projection or estimate for EPS provided by a company in advance of the company reporting actual results. Guidance is classified as negative if the estimate (or mid-point of a range estimates) provided by a company is lower than the mean EPS estimate the day before the guidance was issued. Guidance is classified as positive if the estimate (or mid-point of a range of estimates) provided by the company is higher than the mean EPS estimate the day before the guidance was issued.

At this point in time, 104 companies in the index have issued EPS guidance for Q4 2018. Of these 104 companies, 71 have issued negative EPS guidance and 33 have issued positive EPS guidance. The percentage of companies issuing negative EPS guidance is 68% (71 out of 104), which is slightly below the 5-year average of 70%.

Earnings Growth: 12.8%

The estimated (year-over-year) earnings growth rate for Q4 2018 is 12.8%. If 12.8% is the final growth rate for the quarter, it will mark the fifth straight quarter of double-digit earnings growth for the index. All eleven sectors are expected to report year-over-year growth in earnings. Six sectors are projected to report double-digit earnings growth, led by the Energy, Financials, and Industrials sectors.

Energy: Higher Year-Over-Year Oil Prices Helping to Drive Broad-Based Growth

The Energy sector is expected to report the highest (year-over-year) earnings growth of all eleven sectors at 85.0%. Higher oil prices are helping to drive the unusually high growth rate for the sector. Despite the recent decline in price, the average price of oil to date in Q4 2018 ($62.21) is still 12% higher than the average price of oil in Q4 2017 ($55.30). At the sub-industry level, five of the six sub-industries in the sector are projected to report earnings growth for the quarter: Oil & Gas Drilling (N/A due to $0 earnings in year-ago), Oil & Gas Exploration & Production (175%), Integrated Oil & Gas (89%), Oil & Gas Storage & Transportation (68%), and Oil & Gas Refining & Marketing (52%). The Oil & Gas Equipment & Services (-6%) sub-industry is the only sub-industry expected to report a year-over-year decline in earnings in the sector.

Financials: 4 of 5 Industries Expected to Report Double-Digit Growth

The Financials sector is expected to report the second highest (year-over-year) earnings growth of all eleven sectors at 15.2%. At the industry level, all five industries in this sector are predicted to report earnings growth for the quarter. Four of these five industries are projected to report double-digit growth in earnings: Diversified Financial Services (58%), Consumer Finance (26%), Banks (16%), and Capital Markets (16%).

Industrials: 8 of 12 Industries Expected to Report Double-Digit Growth

The Industrials sector is expected to report the third highest (year-over-year) earnings growth of all eleven sectors at 14.5%. At the industry level, 9 of the 12 industries in this sector are predicted to report earnings growth for the quarter. Eight of these nine industries are projected to report double-digit growth in earnings, led by the Construction & Engineering (54%), Trading Companies & Distributors (39%), and Road & Rail (32%) industries. At the company level, General Electric is the largest detractor to earnings growth for the sector. The mean EPS estimate for GE for Q4 2018 is $0.22, compared to actual EPS of $0.27 in the year-ago quarter. If this company were excluded, the estimated earnings growth rate for the sector would improve to 17.4% from 14.5%.

Revenue Growth: 6.5%

The estimated (year-over-year) revenue growth rate for Q4 2018 is 6.5%. Ten of the eleven sectors are expected to report year-over-year growth in revenues. Four sectors are projected to report double-digit growth in revenues: Communication Services, Energy, Real Estate, and Materials.

Communication Services: Alphabet Leads Growth

The Communication Services sector is expected to report the highest (year-over-year) revenue growth of all eleven sectors at 20.0%. At the industry level, all four industries in this sector are predicted to report revenue growth. Two of these four industries are projected to report double-digit revenue growth: Interactive Media & Services (45%) and Media (16%). At the company level, Alphabet is projected to be the largest contributor to revenue growth for this sector. The mean revenue estimate for Alphabet for Q4 4018 is $38.9 billion, compared to revenue of $25.9 billion in the year-ago quarter. Because Alphabet is a dual-listed ticker in the index, the company's revenue numbers are counted twice in the growth rate calculation (once for GOOG and once for GOOGL). If this company were excluded, the estimated revenue growth rate for this sector would fall to 11.8% from 20.0%.

Energy: 4 of 6 Sub-Industries Expected to Report Double-Digit Growth

The Energy sector is expected to report the second highest (year-over-year) revenue growth of all eleven sectors at 13.7%. At the sub-industry level, five of the six sub-industries are predicted to report revenue growth. Four of these five sub-industries are projected to report double-digit revenue growth: Oil & Gas Drilling (27%), Oil & Gas Refining & Marketing (18%), Oil & Gas Exploration & Production (16%), and Integrated Oil & Gas (14%).

Real Estate: CBRE Group Leads Growth

The Real Estate sector is expected to report the third highest (year-over-year) revenue growth of all eleven sectors at 11.1%. At the company level, CBRE Group is projected to be the largest contributor to revenue growth for the sector. The mean revenue estimate for CBRE Group for Q4 2018 is $5.95 billion, compared to revenue of $4.34 billion in the year-ago quarter. If this company were excluded, the revenue growth rate for the sector would fall to 5.6% from 11.1%.

Materials: Linde Leads Growth on Easy Comparison to Standalone Revenue for Praxair

The Materials sector is expected to report the fourth highest (year-over-year) revenue growth of all eleven sectors at 10.4%. At the industry level, three of the four industries in this sector are predicted to report revenue growth, led by the Chemicals (14%) industry. At the company level, Linde plc is the projected to be the largest contributor to revenue growth for the sector. However, the estimated revenues for Q4 2018 ($7.25 billion) reflect the combination of Praxair and Linde, while the actual revenues for Q4 2017 ($2.95 billion) reflect the standalone Praxair company. This apple-to-orange comparison is the main reason Linde plc is expected to be the largest contributor to revenue growth for the sector. If this company were excluded, the estimated revenue growth rate for the sector would fall to 5.6% from 10.4%.

Looking Ahead: Forward Estimates and Valuation

Single-Digit Growth Projected for First 3 Quarters of 2019

For the fourth quarter, analysts expect companies to report earnings growth of 12.8% and revenue growth of 6.5%. For CY 2018, analysts are projecting companies to report earnings growth of 20.5% and revenue growth of 8.9%. However, analysts expect single-digit earnings growth for the first three quarters of 2019.

For Q1 2019, analysts are projecting earnings growth of 4.3% and revenue growth of 7.0%.

For Q2 2019, analysts are projecting earnings growth of 4.8% and revenue growth of 5.7%.

For Q3 2019, analysts are projecting earnings growth of 5.2% and revenue growth of 5.4%.

For Q4 2019, analysts are projecting earnings growth of 12.0% and revenue growth of 6.1%.

For CY 2019, analysts are projecting earnings growth of 8.3% and revenue growth of 5.5%.

Valuation: Forward P/E Ratio is 15.1, above the 10-Year Average (14.6)

The forward 12-month P/E ratio is 15.1. This P/E ratio is below the 5-year average of 16.4, but above the 10-year average of 14.6. It is also below the forward 12-month P/E ratio of 16.8 recorded at the start of the fourth quarter (September 30). Since the start of the fourth quarter, the price of the index has decreased by 9.0%, while the forward 12-month EPS estimate has increased by 0.8%.

At the sector level, the Consumer Discretionary (19.3) sector has the highest forward 12-month P/E ratio, while the Financials (10.6) sector has the lowest forward 12-month P/E ratio.

Targets & Ratings: Analysts Project 19% Increase in Price Over Next 12 Months

The bottom-up target price for the S&P 500 is 3146.63, which is 18.7% above the closing price of 2650.54. At the sector level, the Energy (+30.9%) sector is expected to see the largest price increase, as this sector has the largest upside difference between the bottom-up target price and the closing price. On the other hand, the Utilities (+0.3%) sector is expected to see the smallest price increase, as this sector has the smallest upside difference between the bottom-up target price and the closing price.

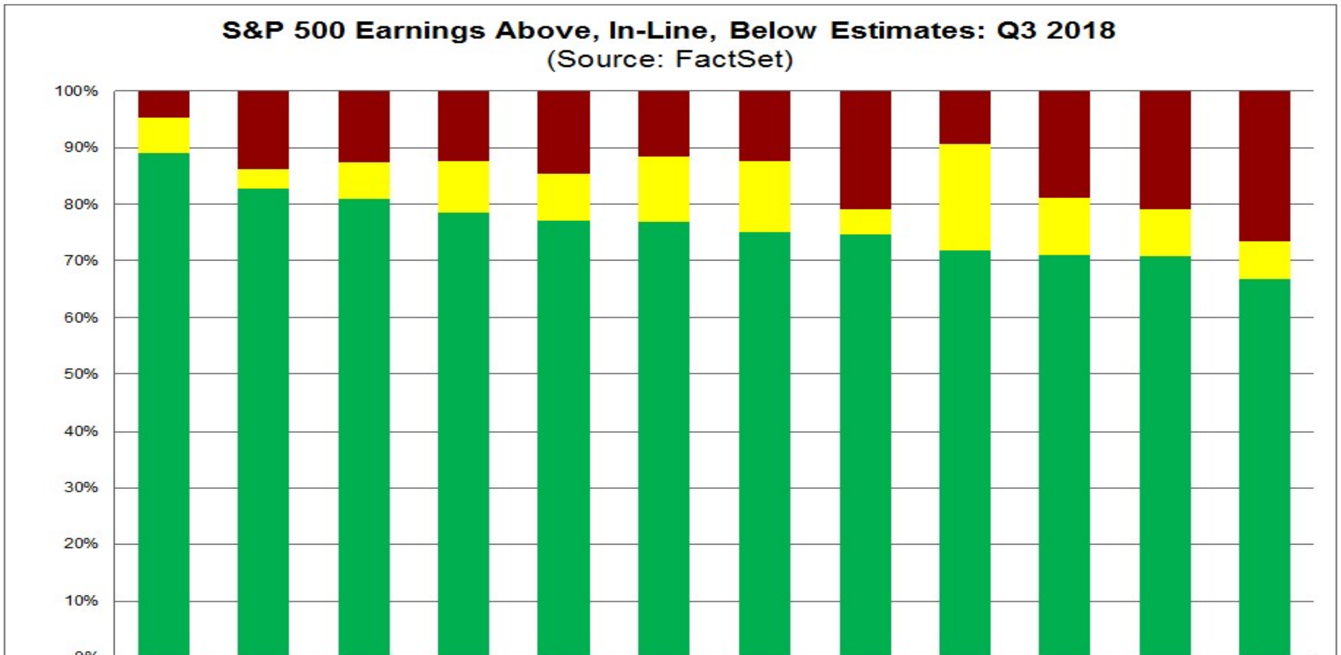
Overall, there are 11,136 ratings on stocks in the S&P 500. Of these 11,136 ratings, 53.9% are Buy ratings, 40.8% are Hold ratings, and 5.3% are Sell ratings. At the sector level, the Energy (66%) sector has the highest percentage of Buy ratings, while the Consumer Staples (40%) sector has the lowest percentage of Buy ratings.

For more details, please see pages 2 – 5.

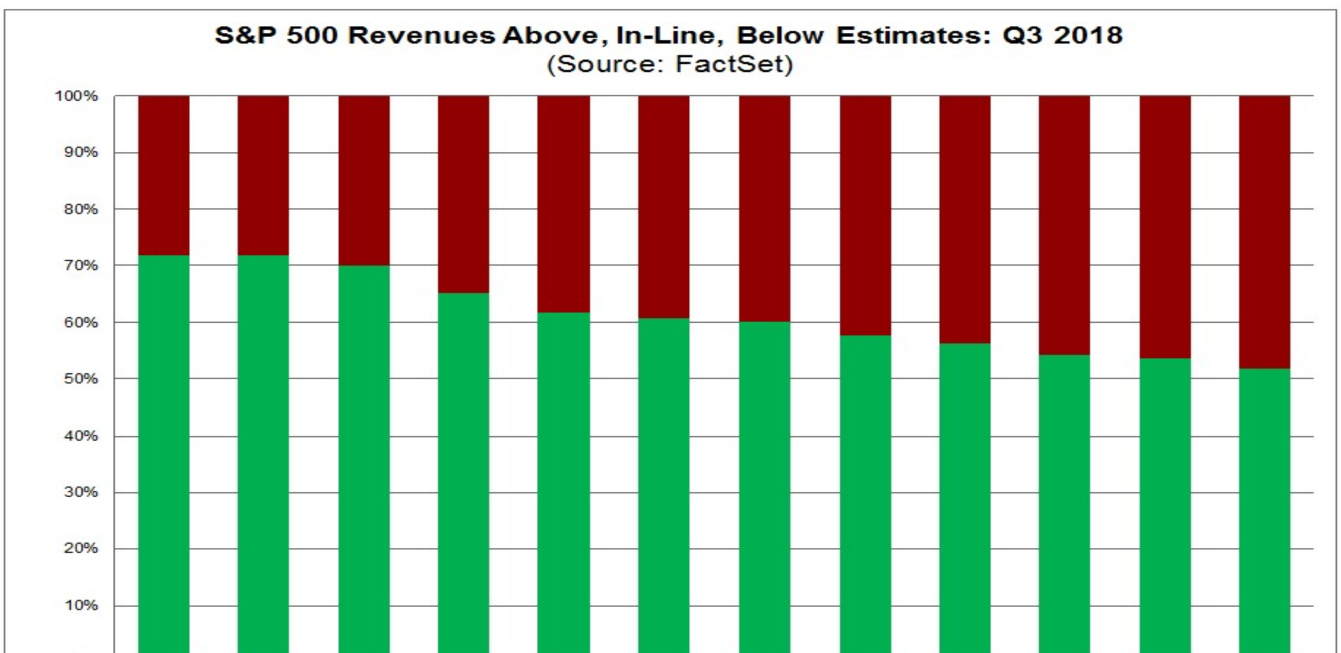
Companies Reporting Next Week: 14

During the upcoming week, 14 S&P 500 companies (including 2 Dow 30 components) are scheduled to report results for the fourth quarter.

Q3 2018: Scorecard

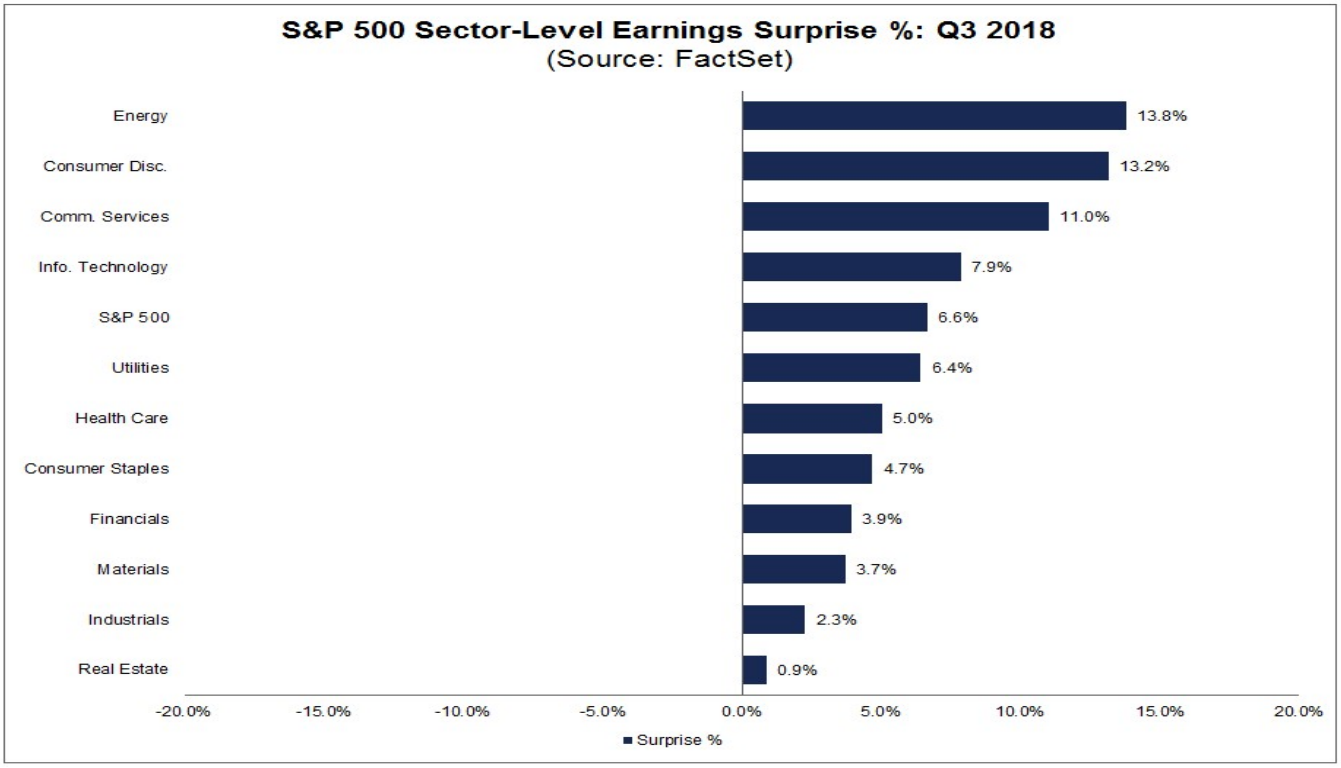


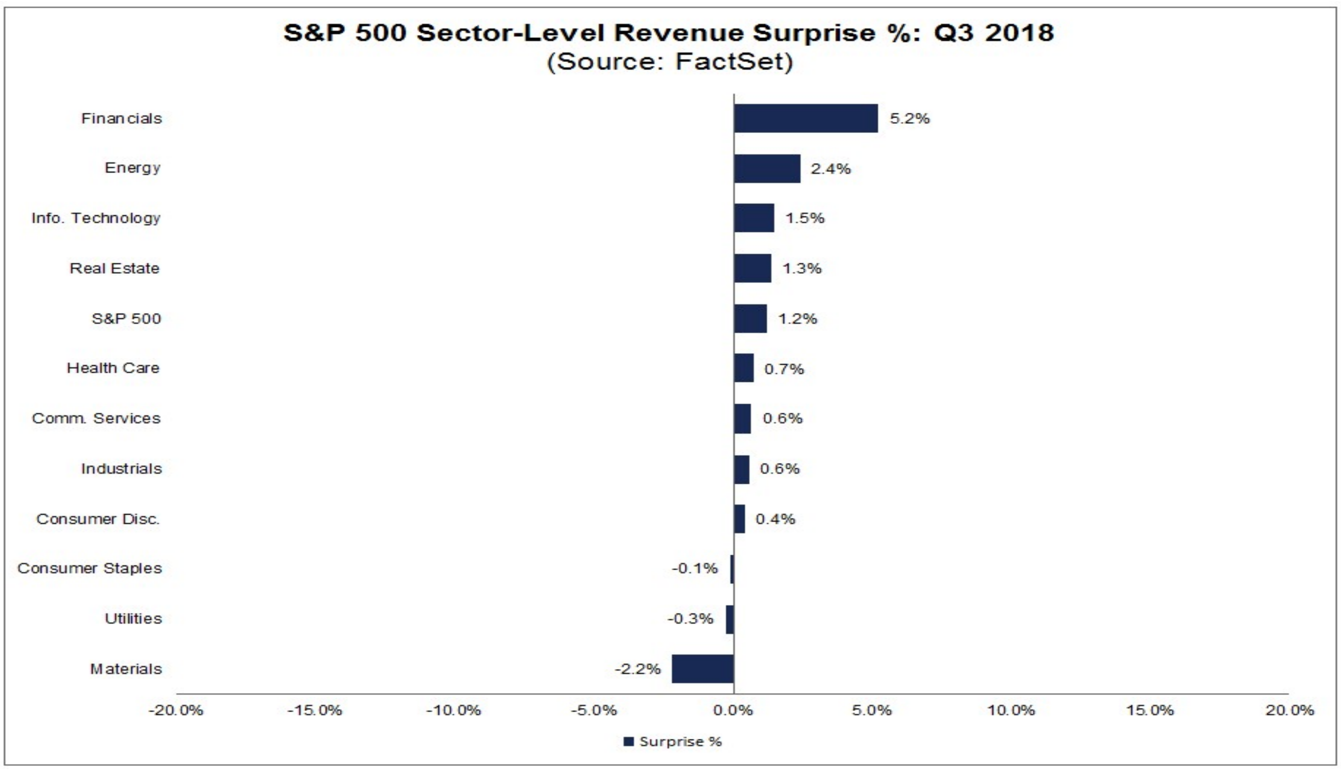
	Info. Technology	Utilities	Health Care	Consumer Disc.	S&P 500	Comm. Services	Consumer Staples	Financials	Real Estate	Industrials	Materials	Energy
Below	5%	14%	13%	12%	15%	12%	13%	21%	9%	19%	21%	27%
In-Line	6%	3%	6%	9%	8%	12%	13%	4%	19%	10%	8%	7%
Above	89%	83%	81%	78%	77%	77%	75%	75%	72%	71%	71%	67%



	Real Estate	Info. Technology	Energy	Health Care	S&P 500	Financials	Consumer Disc.	Comm. Services	Consumer Staples	Materials	Industrials	Utilities
Below	28%	28%	30%	35%	38%	39%	40%	42%	44%	46%	46%	48%
In-Line	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Above	72%	72%	70%	65%	62%	61%	60%	58%	56%	54%	54%	52%

Q3 2018: Scorecard





Earnings Insight

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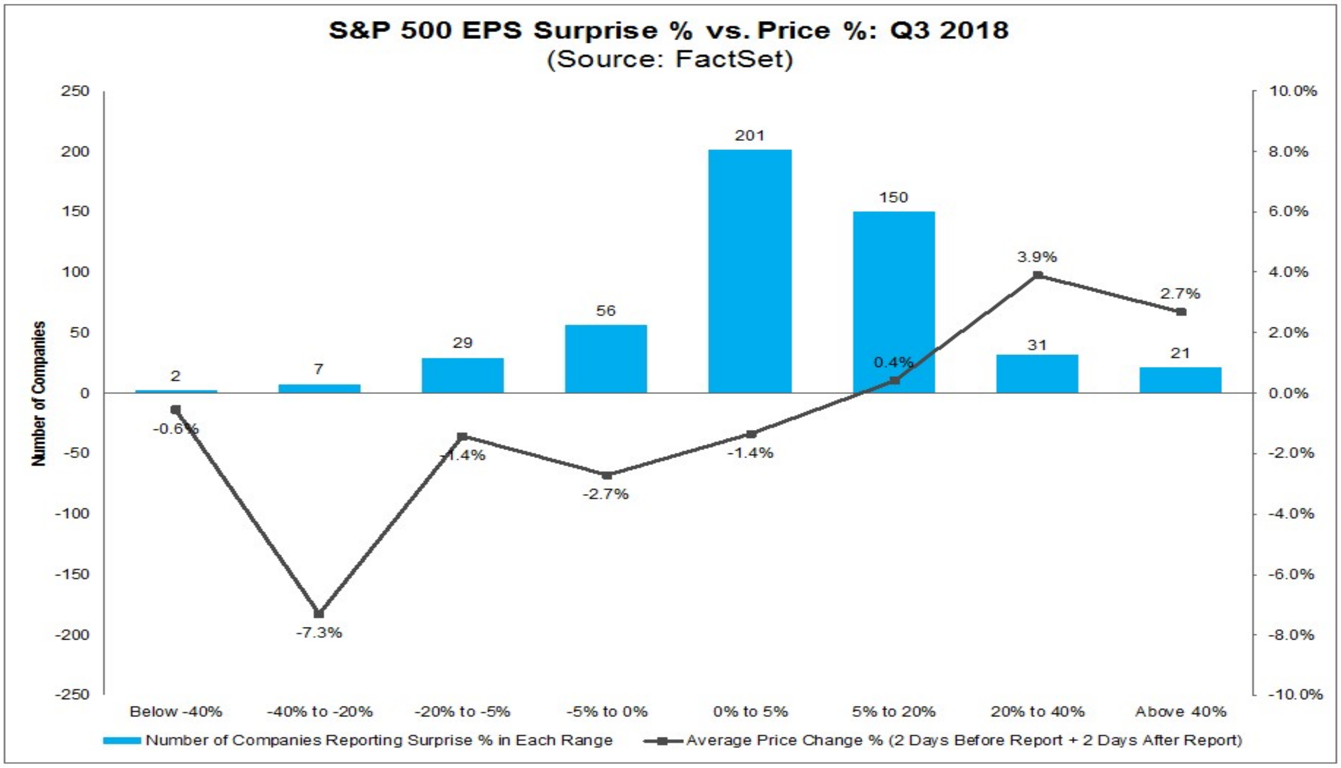
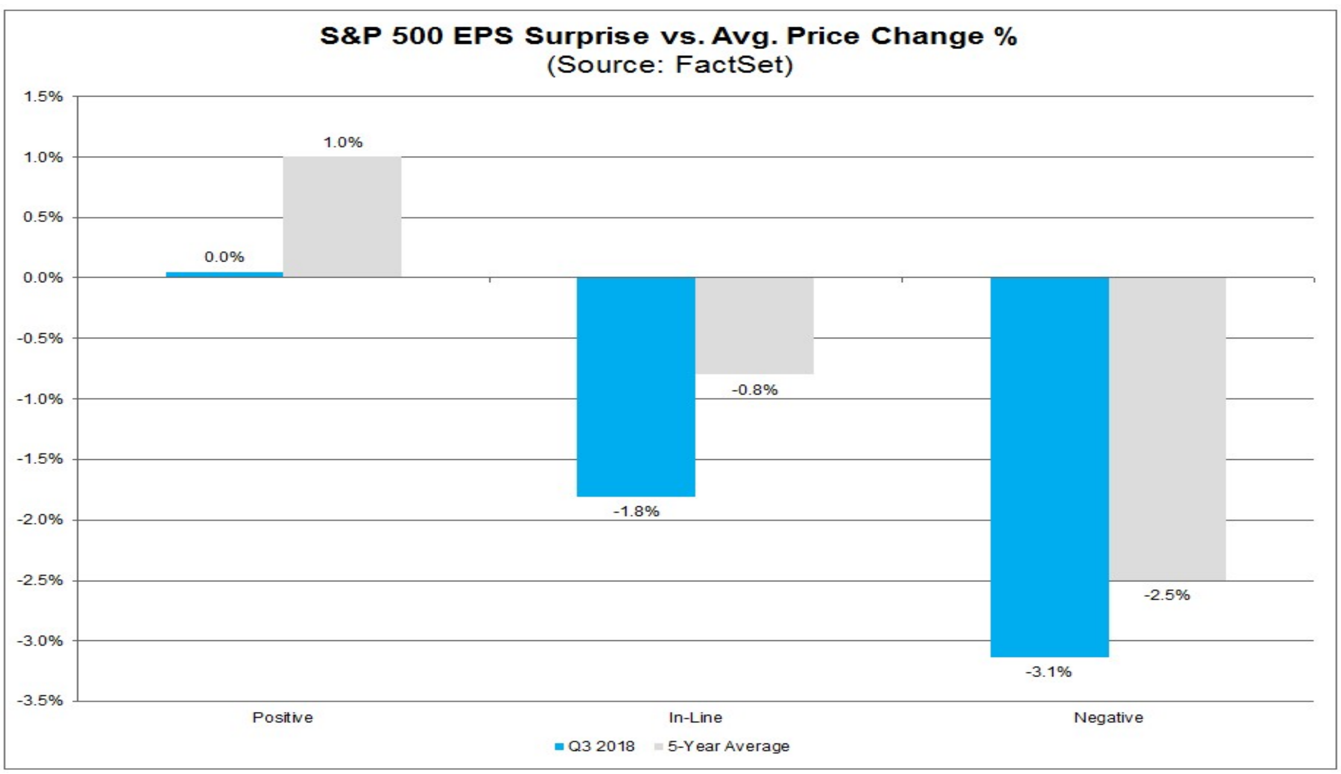
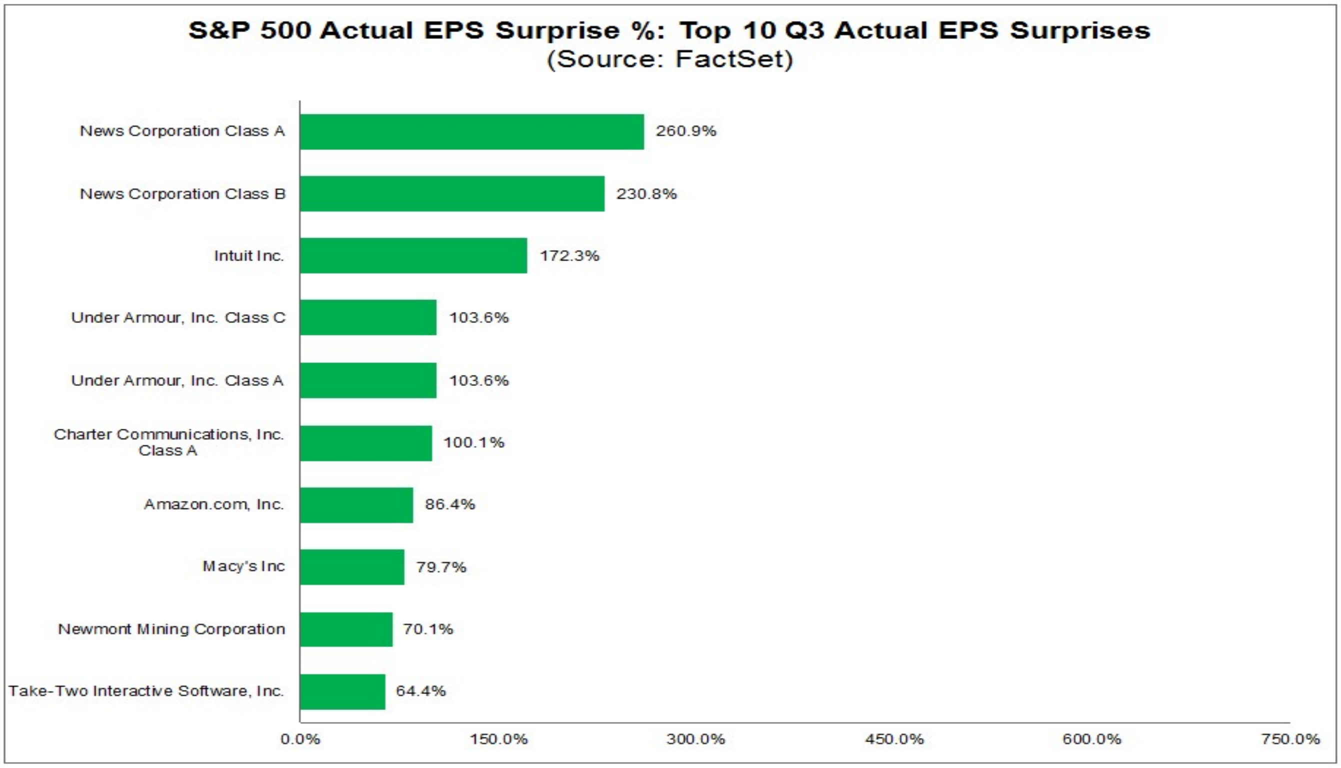
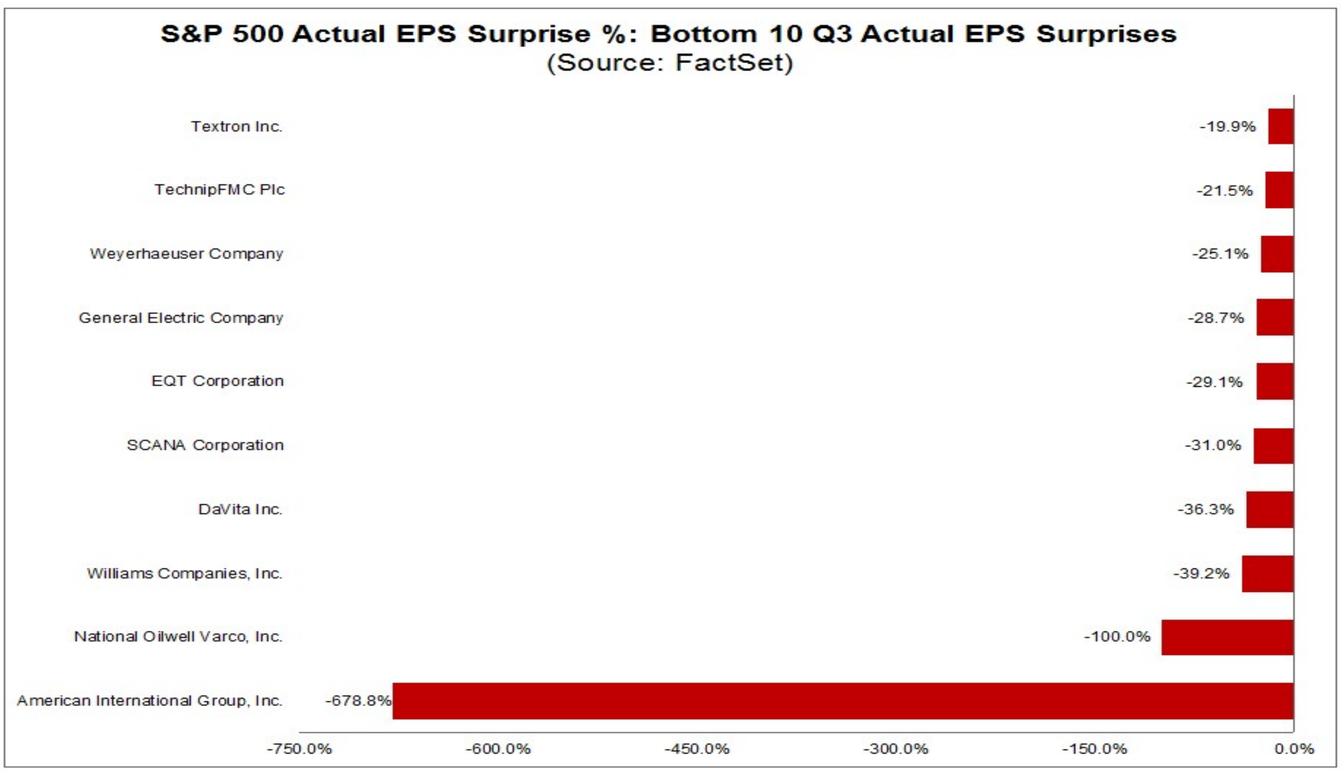
Q3 2018: Scorecard



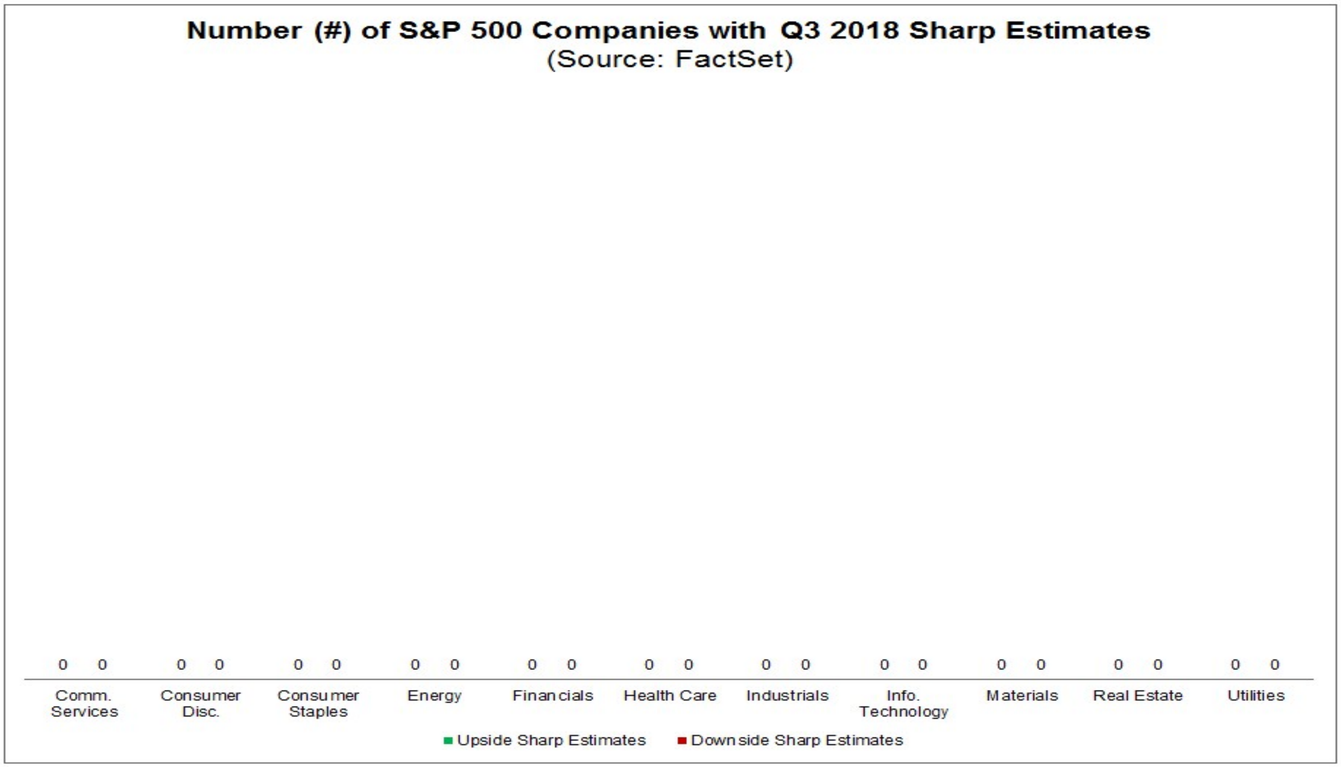


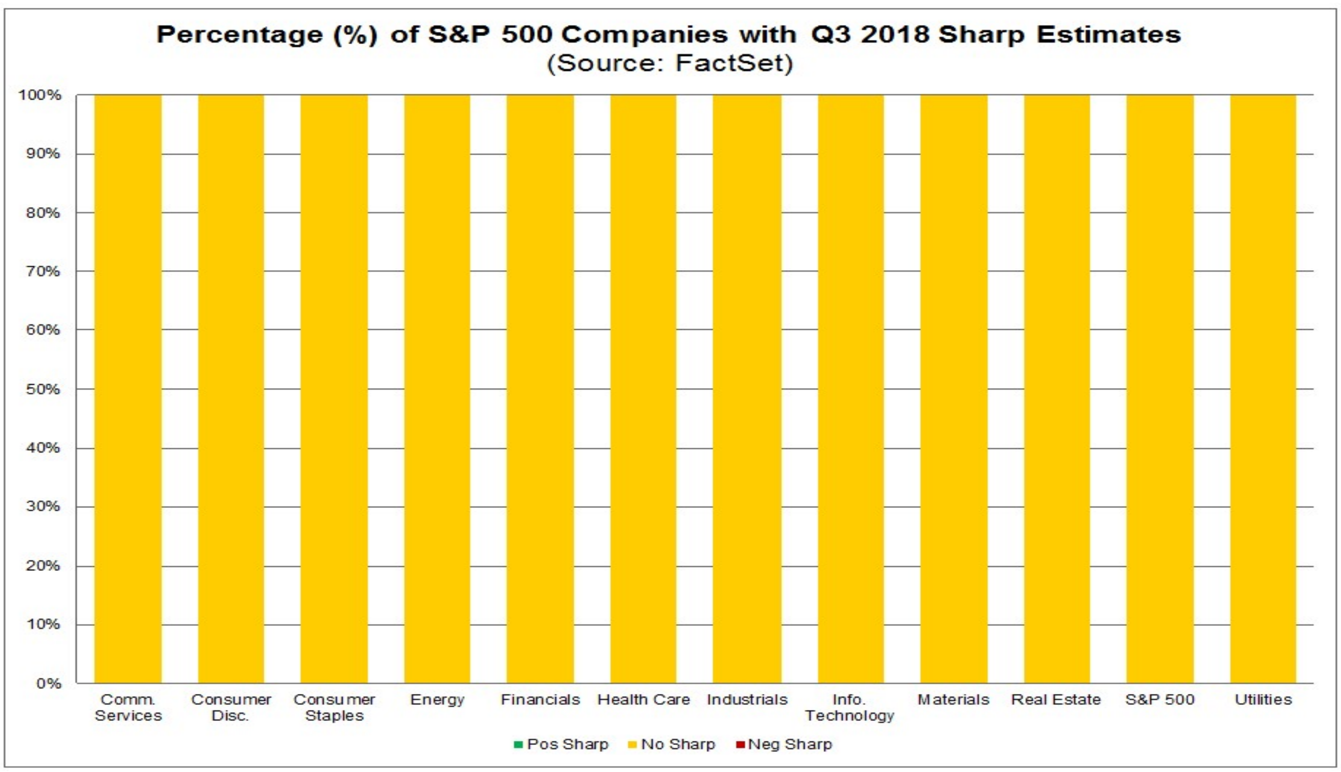
Q3 2018: Scorecard





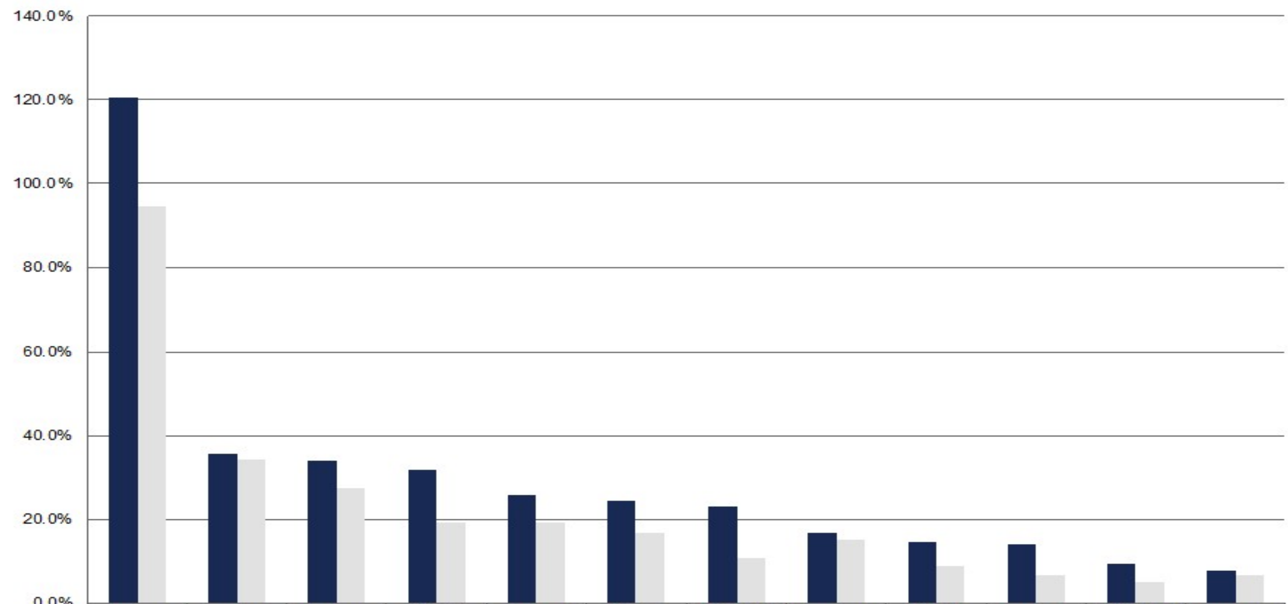
Q3 2018: Projected EPS Surprises (Sharp Estimates)





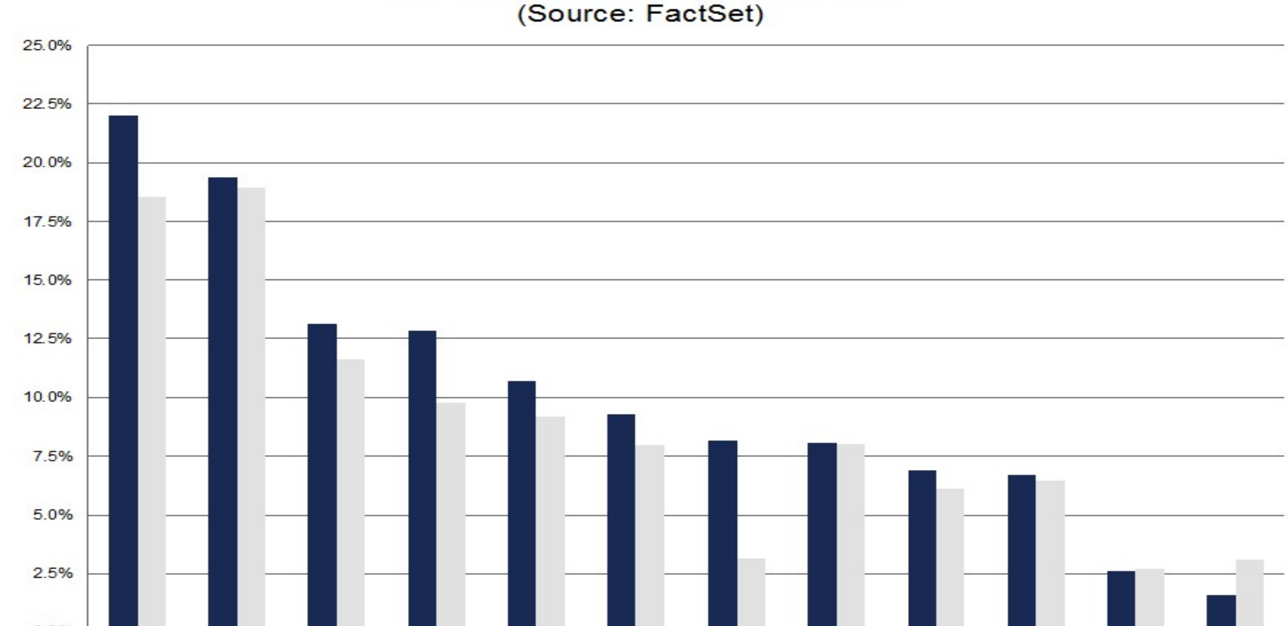
Q3 2018: Growth

S&P 500 Earnings Growth: Q3 2018
(Source: FactSet)



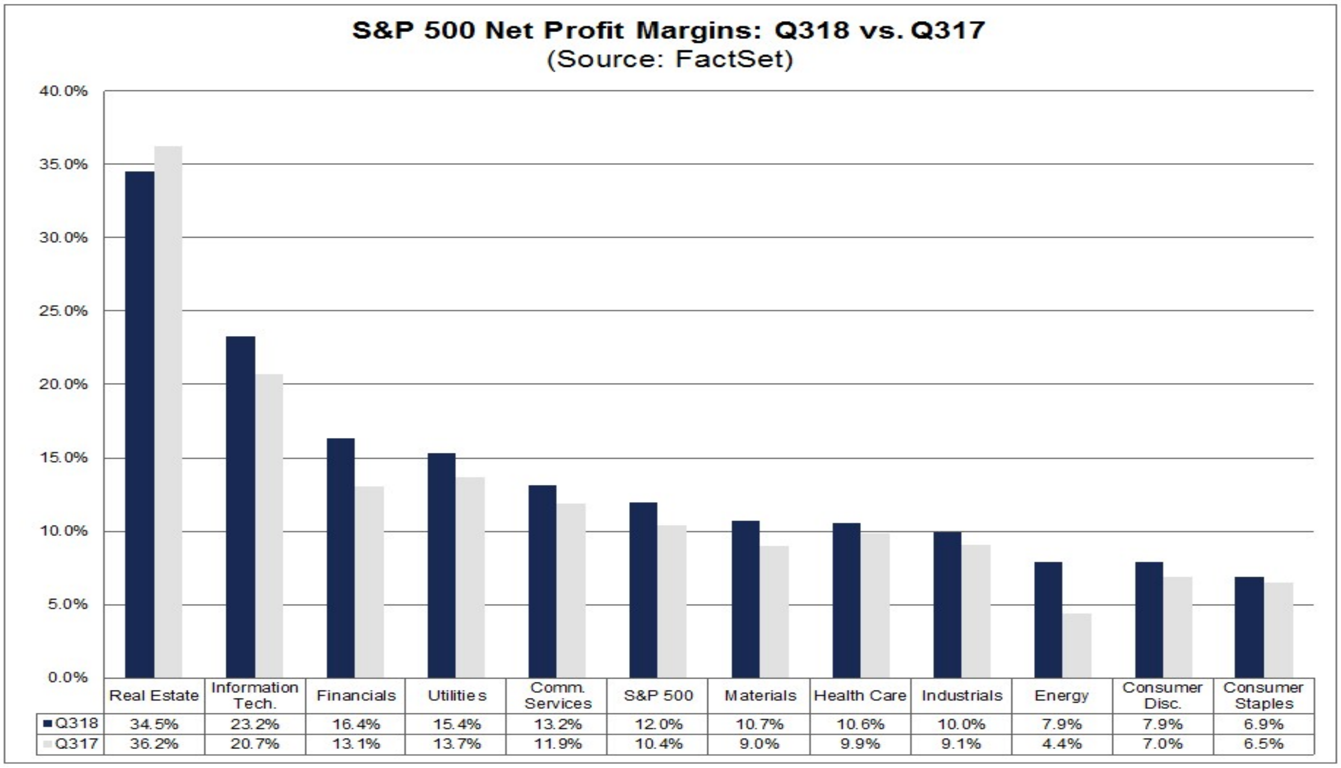
	Energy	Financials	Materials	Comm. Services	S&P 500	Info. Technology	Consumer Disc.	Industrials	Health Care	Utilities	Consumer Staples	Real Estate
Today	120.5%	35.7%	34.2%	31.8%	26.0%	24.5%	23.0%	16.7%	14.5%	14.2%	9.3%	7.8%
30-Sep	94.6%	34.2%	27.6%	19.3%	19.3%	16.8%	10.8%	15.1%	8.9%	6.6%	5.1%	6.6%

S&P 500 Revenue Growth: Q3 2018
(Source: FactSet)

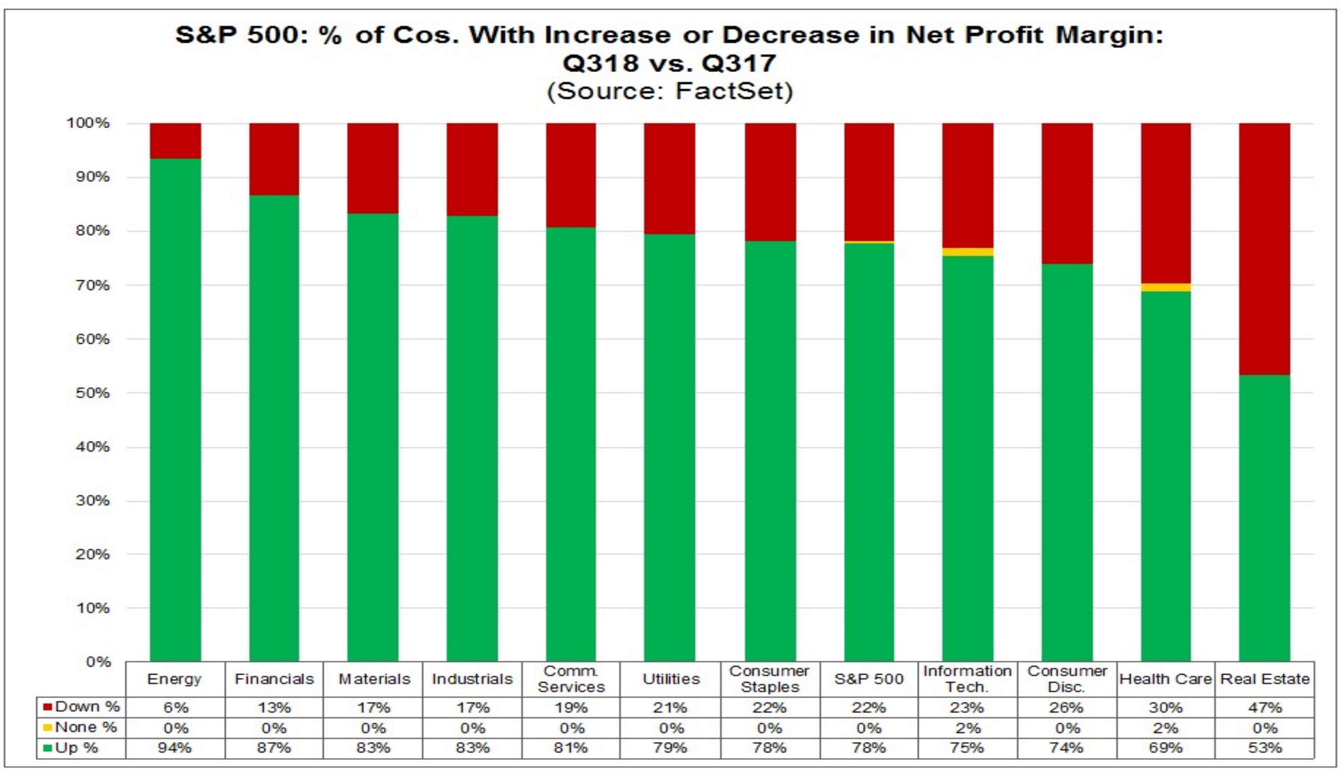


	Energy	Comm. Services	Real Estate	Materials	Info. Technology	S&P 500	Financials	Consumer Disc.	Health Care	Industrials	Consumer Staples	Utilities
Today	22.0%	19.4%	13.1%	12.8%	10.7%	9.3%	8.2%	8.1%	6.9%	6.7%	2.6%	1.6%
30-Sep	18.5%	18.9%	11.6%	9.8%	9.2%	8.0%	3.1%	8.0%	6.1%	6.5%	2.7%	3.1%

Q3 2018: Net Profit Margin

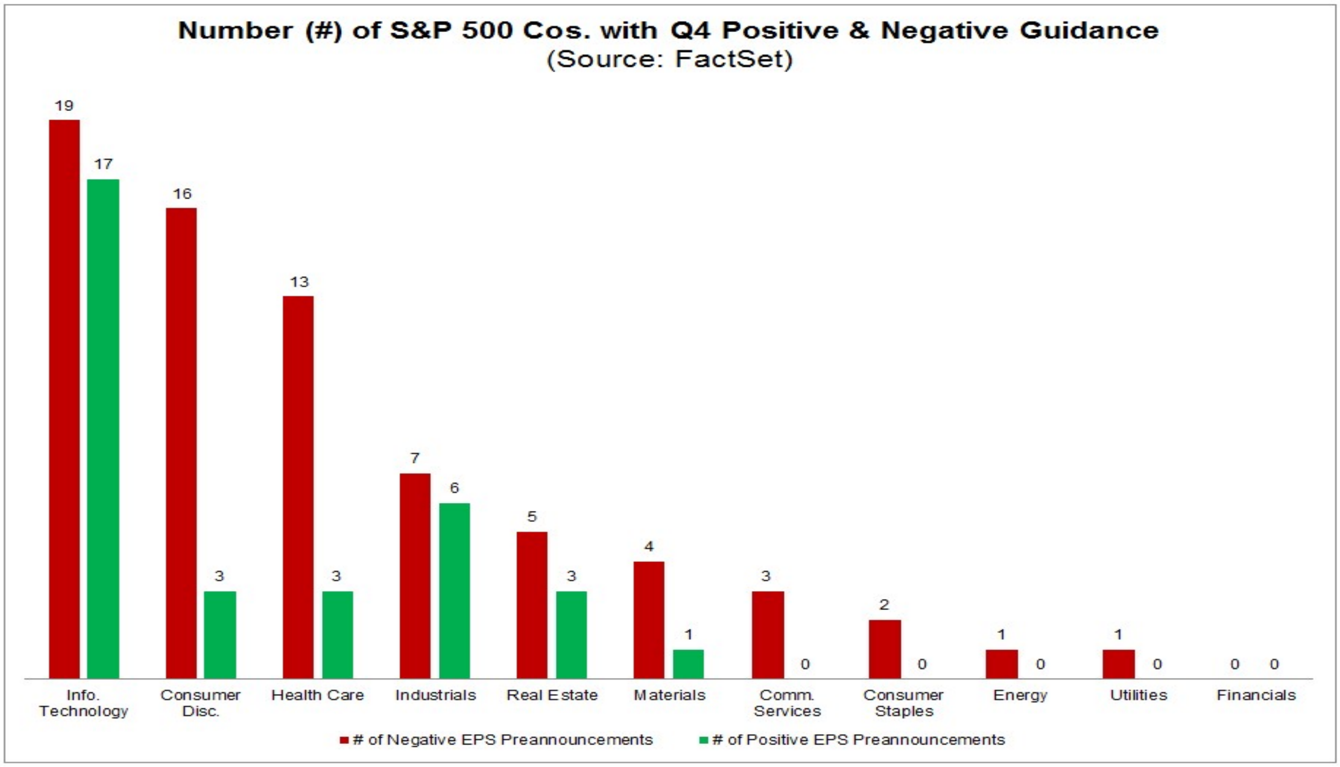


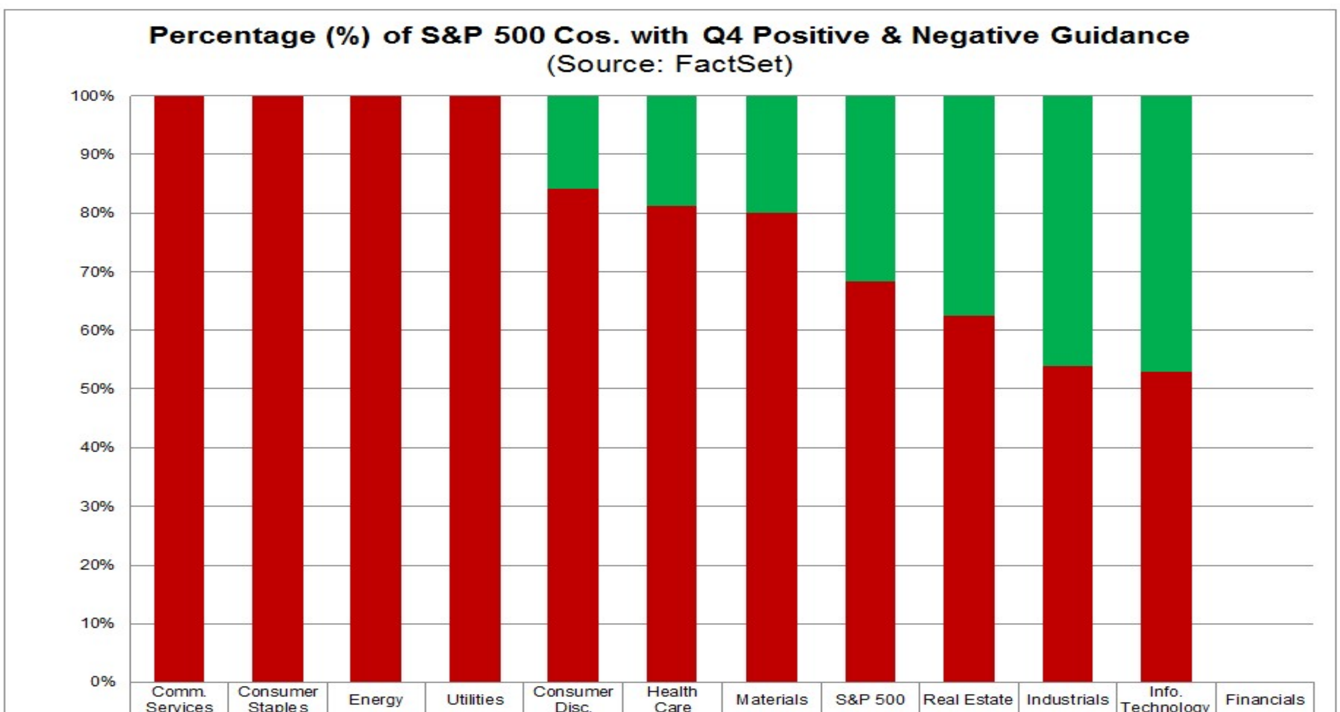
	Real Estate	Information Tech.	Financials	Utilities	Comm. Services	S&P 500	Materials	Health Care	Industrials	Energy	Consumer Disc.	Consumer Staples
Q318	34.5%	23.2%	16.4%	15.4%	13.2%	12.0%	10.7%	10.6%	10.0%	7.9%	7.9%	6.9%
Q317	36.2%	20.7%	13.1%	13.7%	11.9%	10.4%	9.0%	9.9%	9.1%	4.4%	7.0%	6.5%



	Energy	Financials	Materials	Industrials	Comm. Services	Utilities	Consumer Staples	S&P 500	Information Tech.	Consumer Disc.	Health Care	Real Estate
Down %	6%	13%	17%	17%	19%	21%	22%	22%	23%	26%	30%	47%
None %	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	2%	0%
Up %	94%	87%	83%	83%	81%	79%	78%	78%	75%	74%	69%	53%

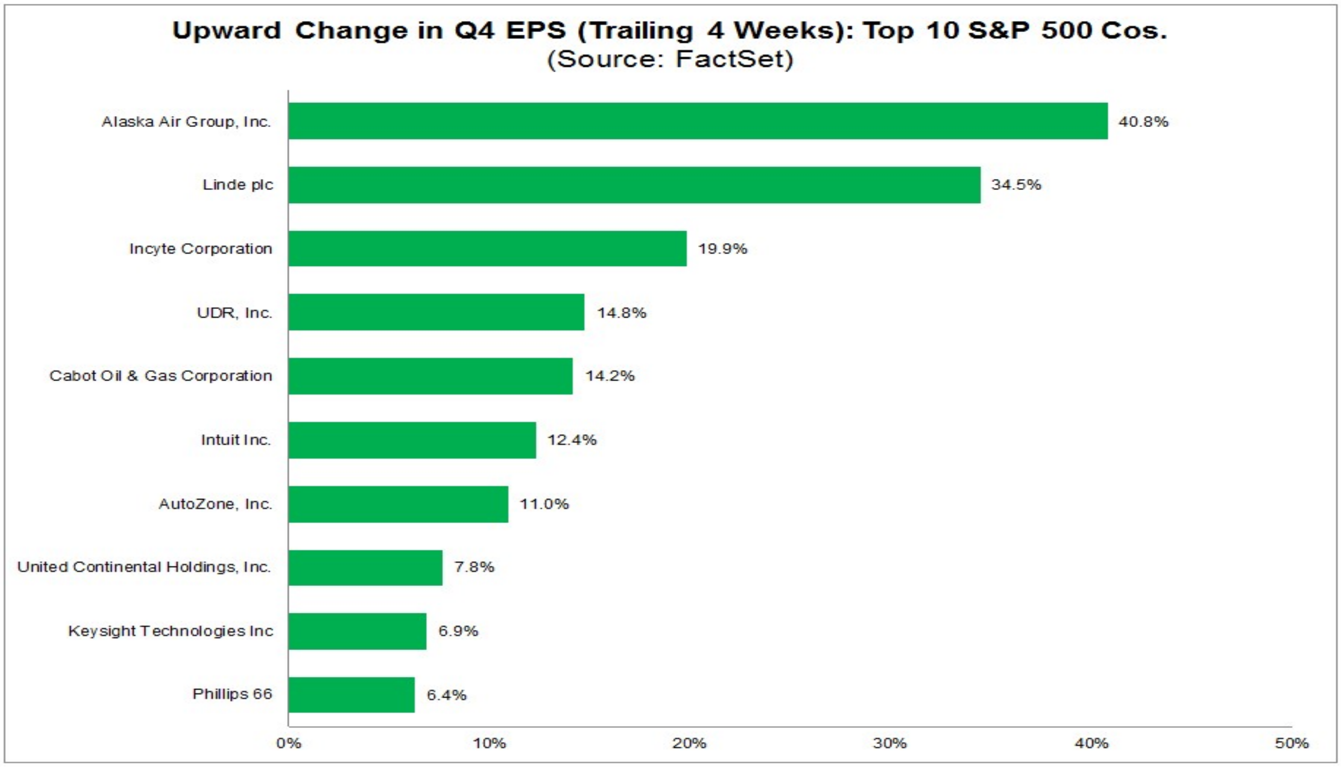
Q4 2018: EPS Guidance

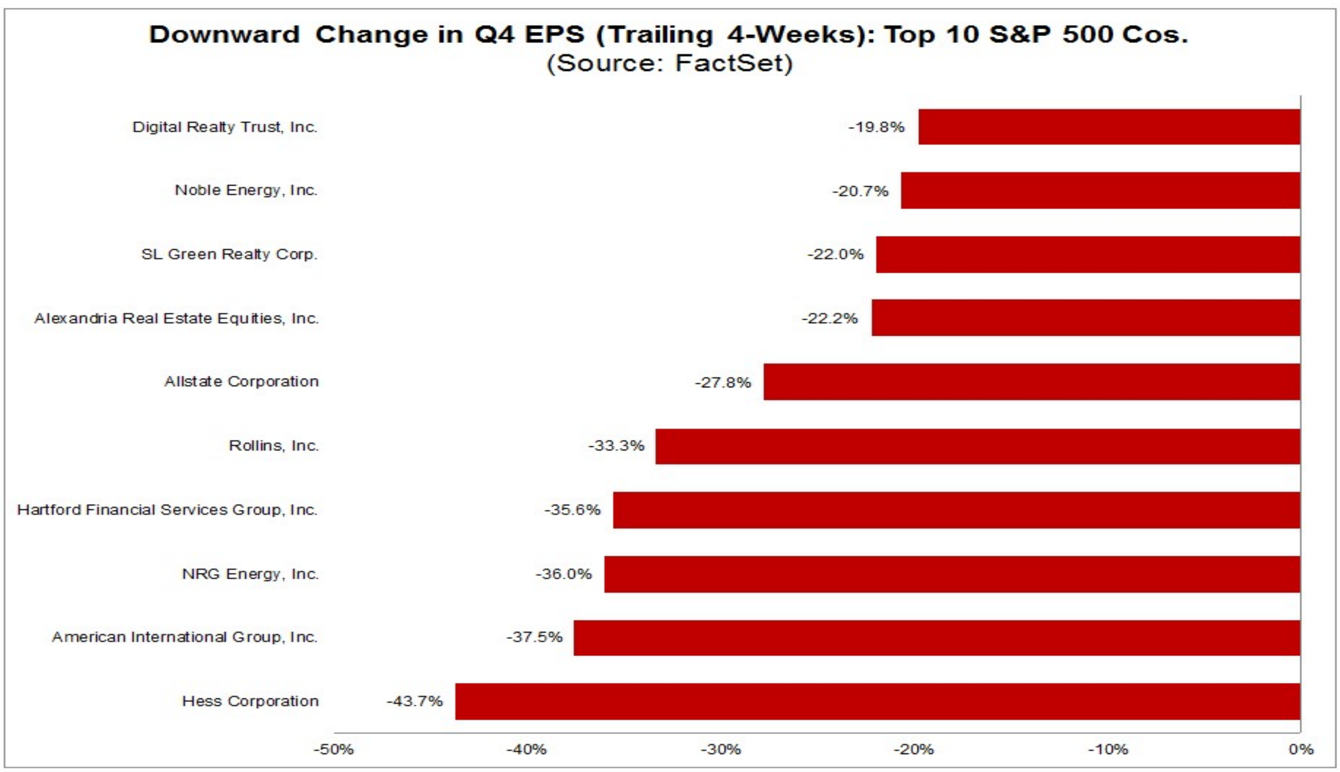




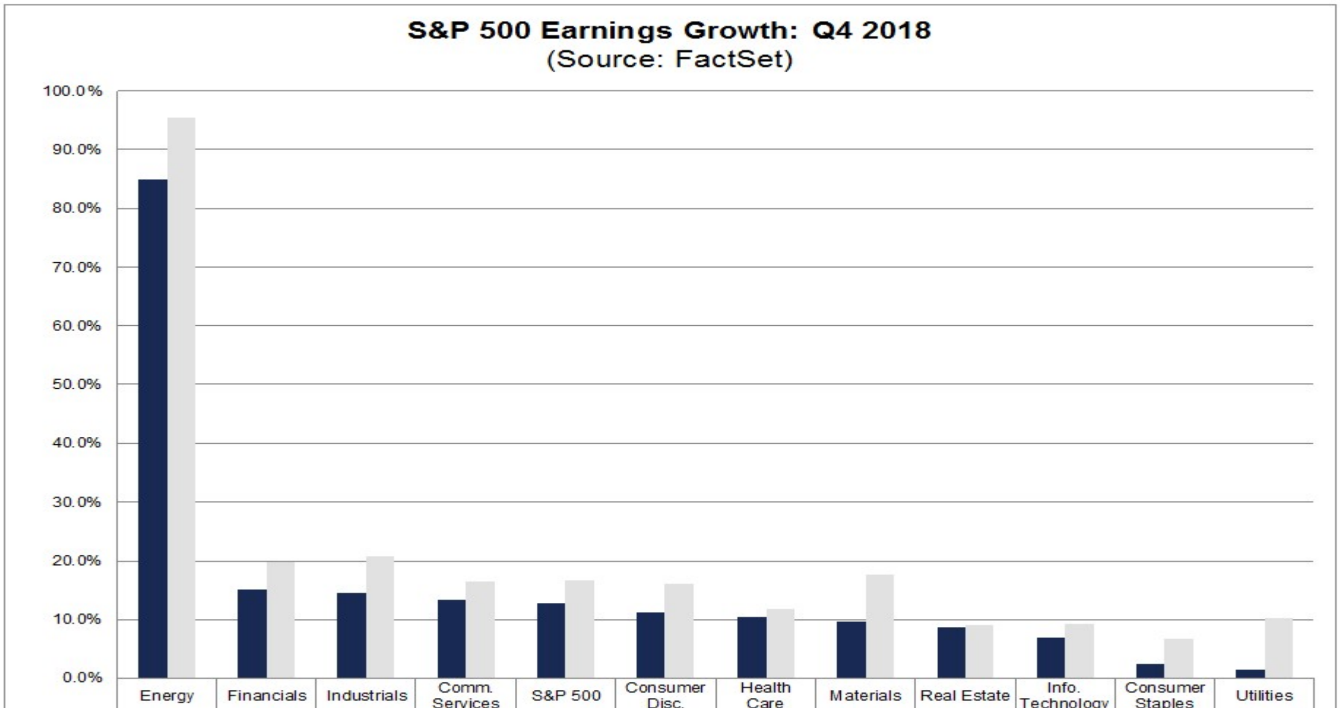
	Comm. Services	Consumer Staples	Energy	Utilities	Consumer Disc.	Health Care	Materials	S&P 500	Real Estate	Industrials	Info. Technology	Financials
Positive	0%	0%	0%	0%	16%	19%	20%	32%	38%	46%	47%	0%
Negative	100%	100%	100%	100%	84%	81%	80%	68%	63%	54%	53%	0%

Q4 2018: EPS Revisions

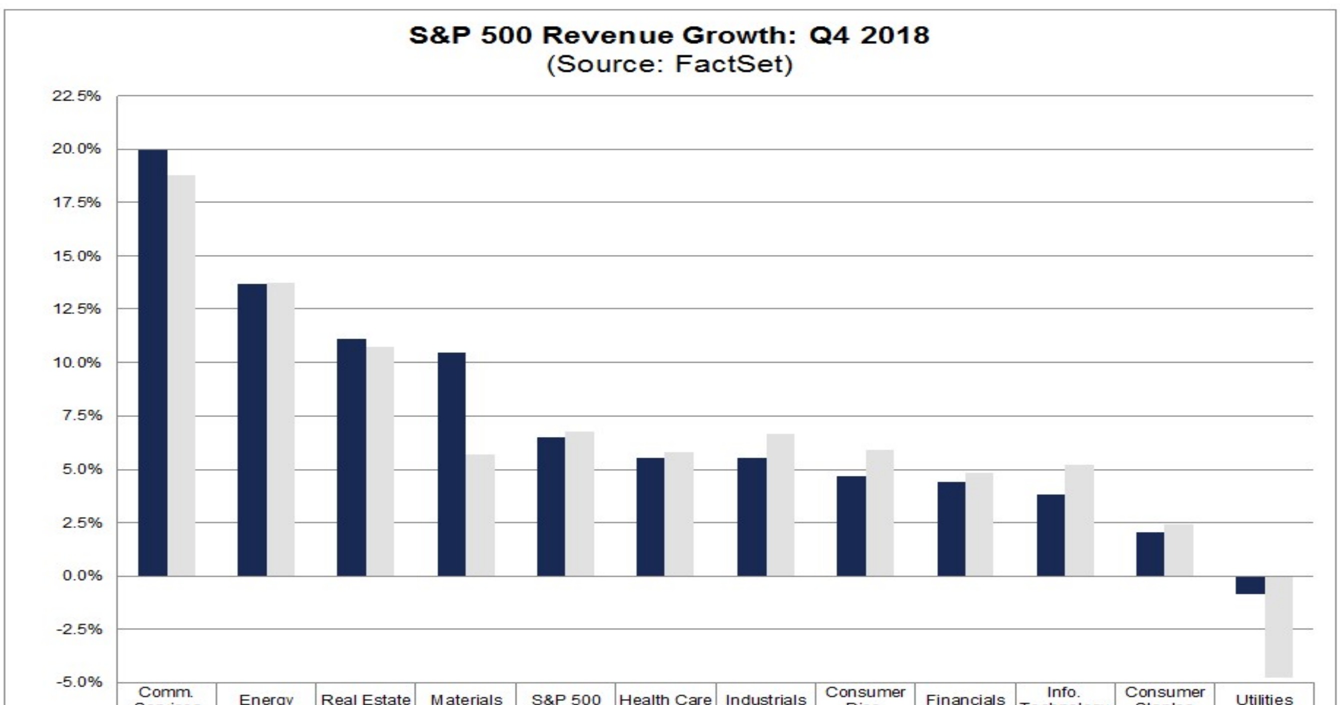




Q4 2018: Growth

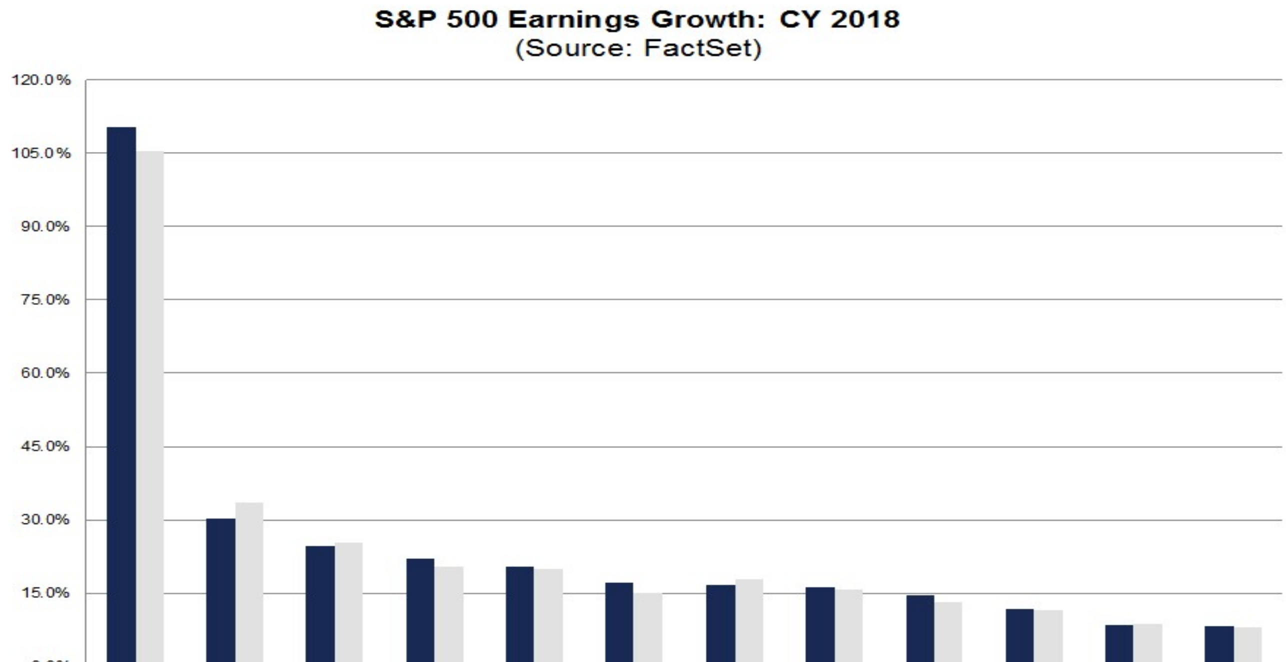


	Energy	Financials	Industrials	Comm. Services	S&P 500	Consumer Disc.	Health Care	Materials	Real Estate	Info. Technology	Consumer Staples	Utilities
Today	85.0%	15.2%	14.5%	13.4%	12.8%	11.2%	10.5%	9.6%	8.7%	7.0%	2.4%	1.4%
30-Sep	95.4%	19.9%	20.7%	16.4%	16.7%	16.1%	11.7%	17.6%	9.1%	9.3%	6.7%	10.2%

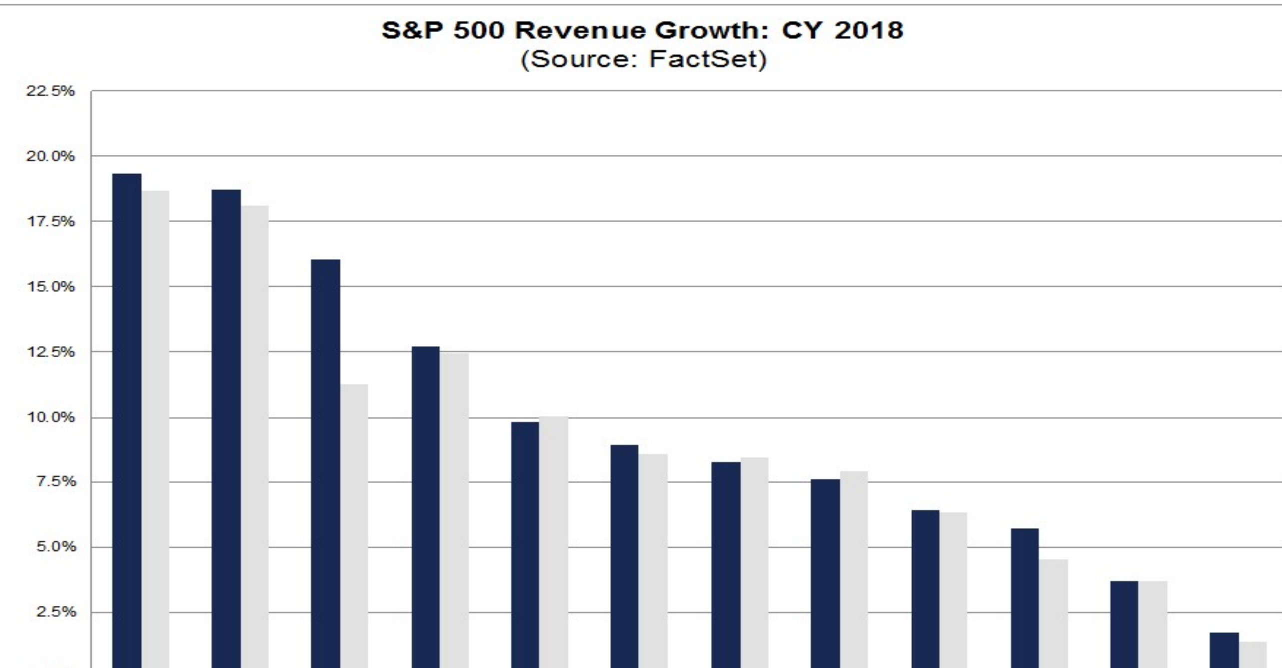


	Comm. Services	Energy	Real Estate	Materials	S&P 500	Health Care	Industrials	Consumer Disc.	Financials	Info. Technology	Consumer Staples	Utilities
Today	20.0%	13.7%	11.1%	10.4%	6.5%	5.5%	5.5%	4.7%	4.4%	3.9%	2.0%	-0.8%
30-Sep	18.8%	13.7%	10.7%	5.7%	6.8%	5.8%	6.7%	5.9%	4.9%	5.2%	2.5%	-4.8%

CY 2018: Growth

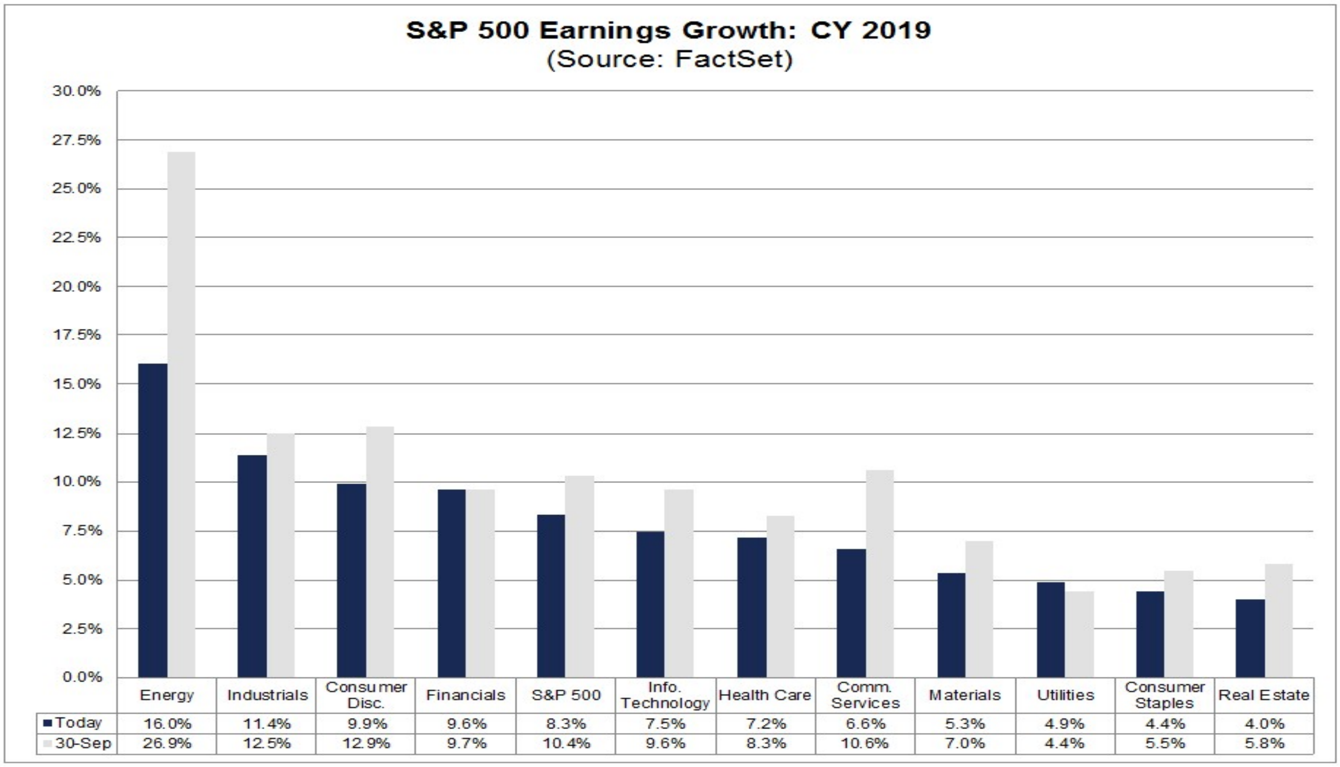


	Energy	Materials	Financials	Comm. Services	S&P 500	Consumer Disc.	Industrials	Info. Technology	Health Care	Utilities	Consumer Staples	Real Estate
Today	110.3%	30.4%	24.8%	22.3%	20.5%	17.2%	16.7%	16.3%	14.5%	11.9%	8.7%	8.2%
30-Sep	105.4%	33.6%	25.4%	20.5%	20.0%	15.2%	17.8%	15.8%	13.3%	11.6%	8.8%	8.1%

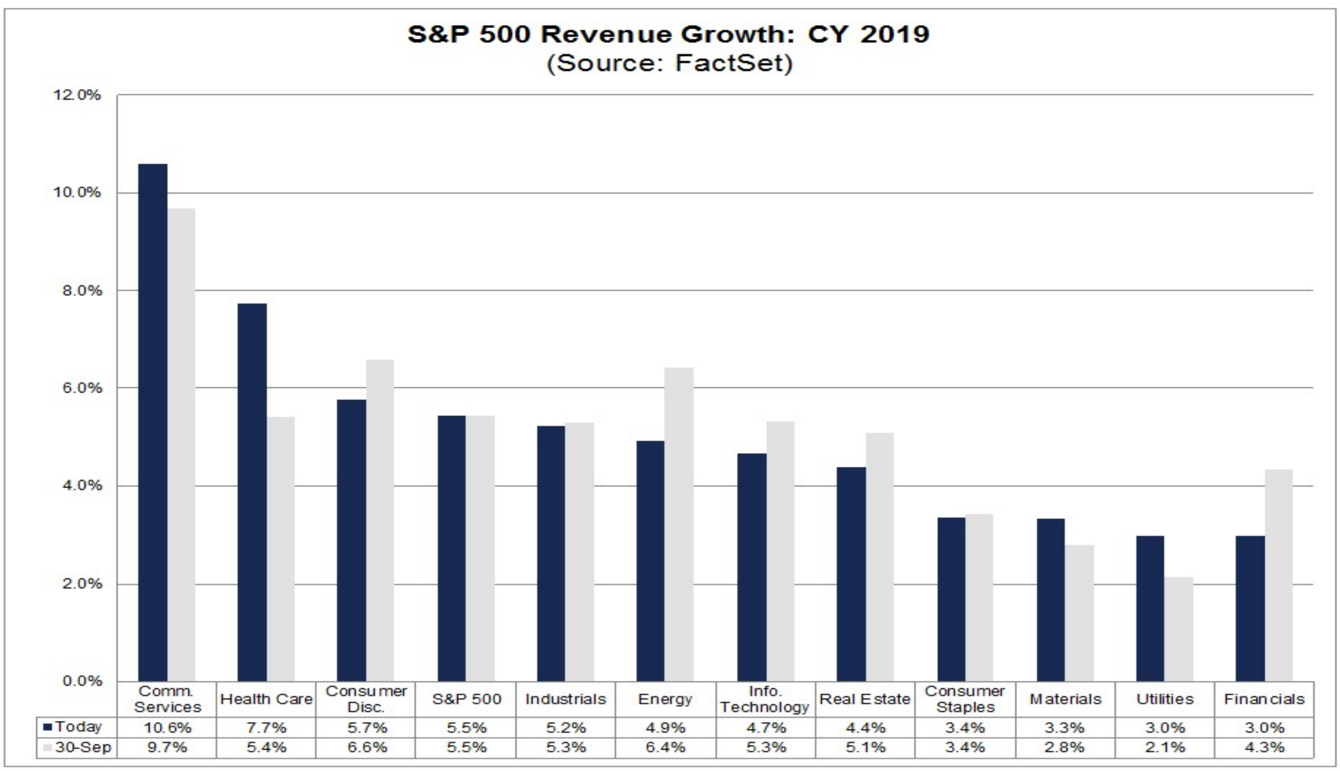


	Energy	Comm. Services	Materials	Real Estate	Info. Technology	S&P 500	Consumer Disc.	Industrials	Health Care	Financials	Consumer Staples	Utilities
Today	19.3%	18.7%	16.0%	12.7%	9.8%	8.9%	8.3%	7.6%	6.4%	5.7%	3.7%	1.7%
30-Sep	18.7%	18.1%	11.2%	12.4%	10.1%	8.6%	8.5%	7.9%	6.3%	4.6%	3.7%	1.4%

CY 2019: Growth

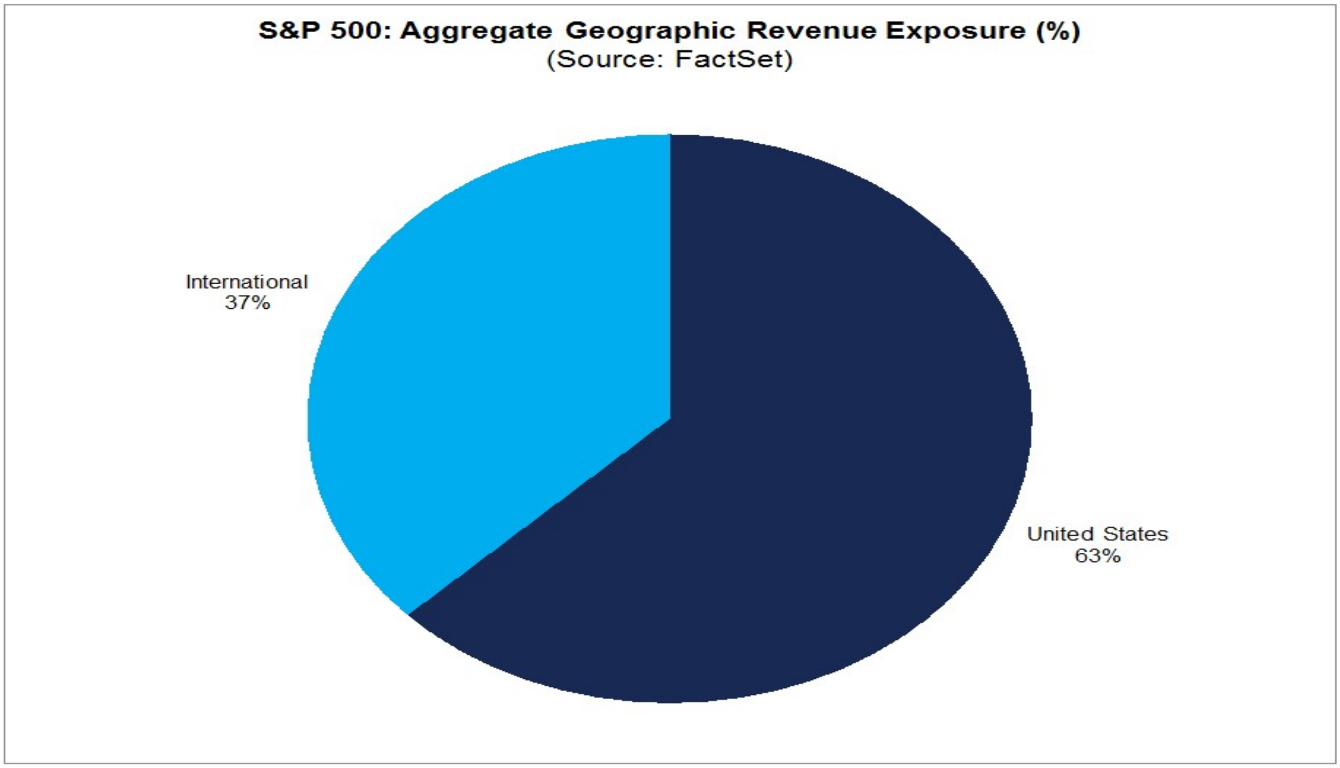


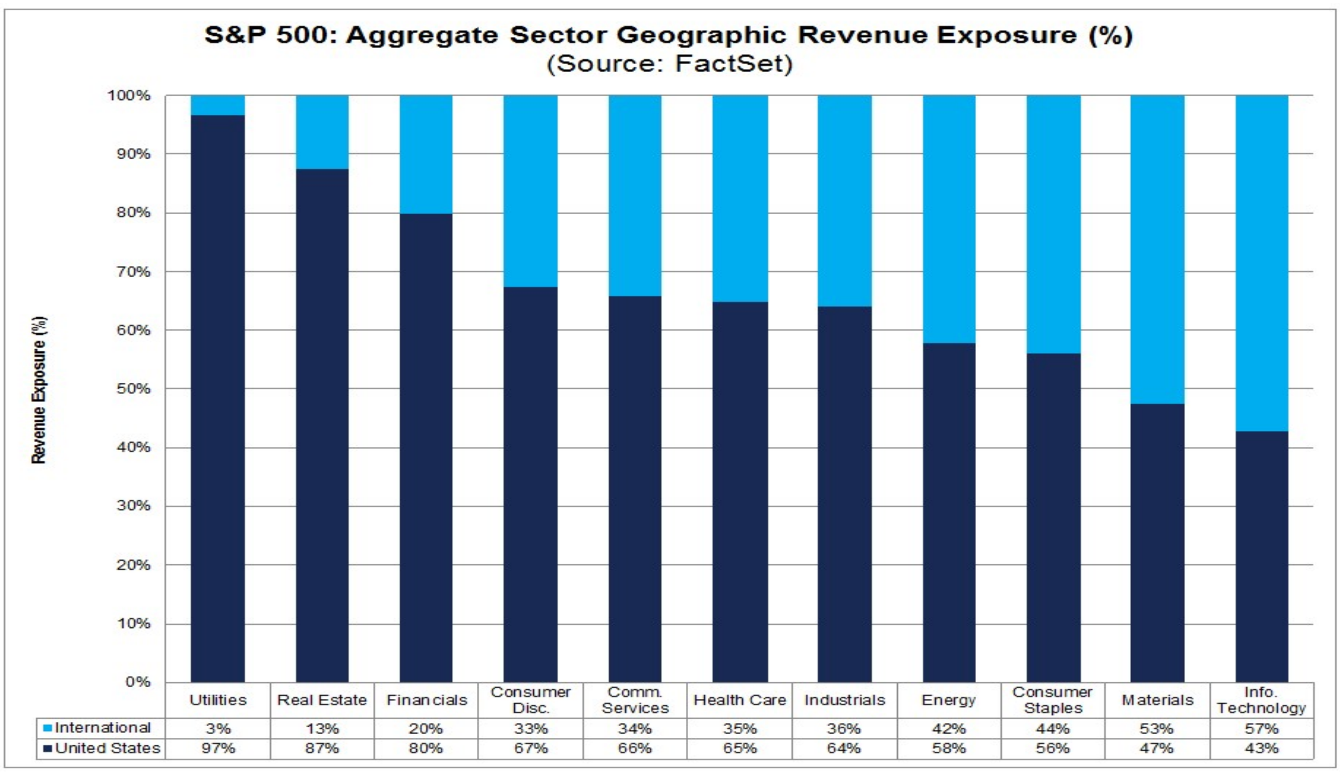
	Energy	Industrials	Consumer Disc.	Financials	S&P 500	Info. Technology	Health Care	Comm. Services	Materials	Utilities	Consumer Staples	Real Estate
Today	16.0%	11.4%	9.9%	9.6%	8.3%	7.5%	7.2%	6.6%	5.3%	4.9%	4.4%	4.0%
30-Sep	26.9%	12.5%	12.9%	9.7%	10.4%	9.6%	8.3%	10.6%	7.0%	4.4%	5.5%	5.8%



	Comm. Services	Health Care	Consumer Disc.	S&P 500	Industrials	Energy	Info. Technology	Real Estate	Consumer Staples	Materials	Utilities	Financials
Today	10.6%	7.7%	5.7%	5.5%	5.2%	4.9%	4.7%	4.4%	3.4%	3.3%	3.0%	3.0%
30-Sep	9.7%	5.4%	6.6%	5.5%	5.3%	6.4%	5.3%	5.1%	3.4%	2.8%	2.1%	4.3%

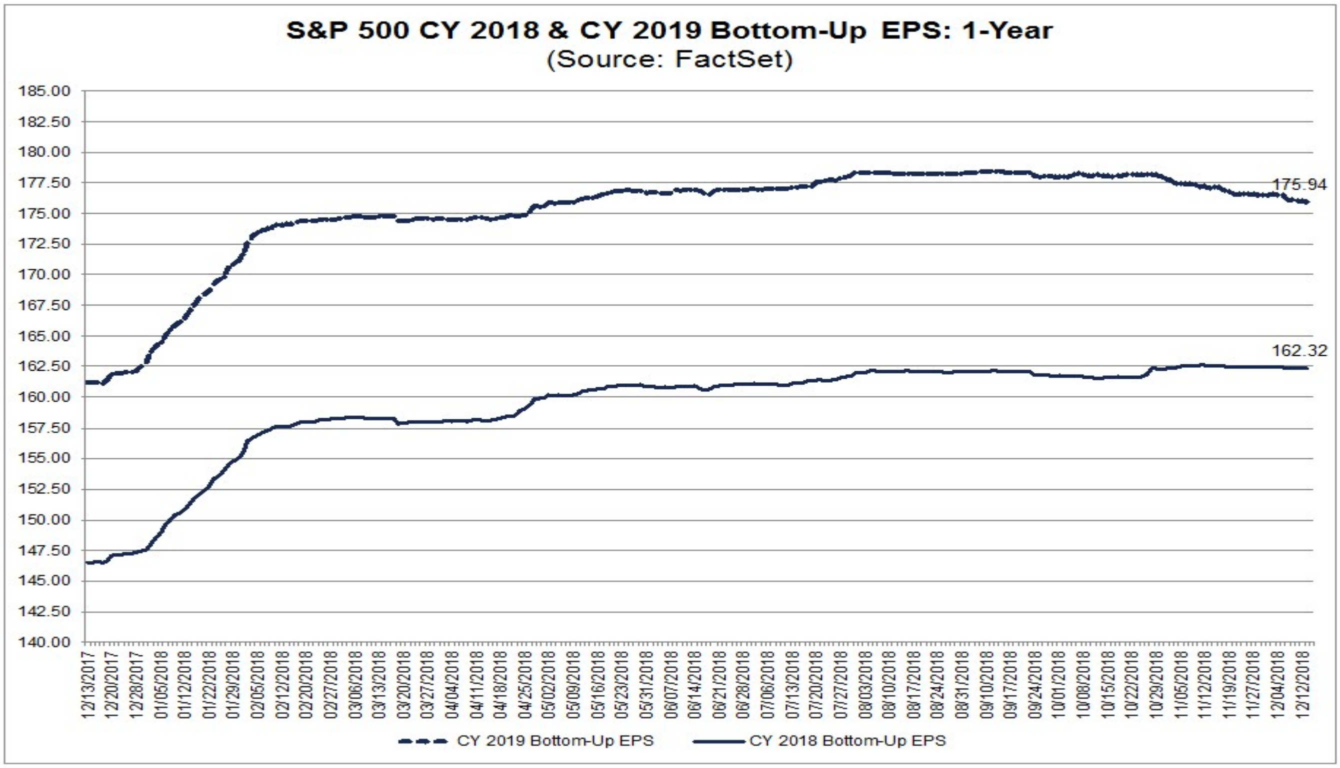
Geographic Revenue Exposure

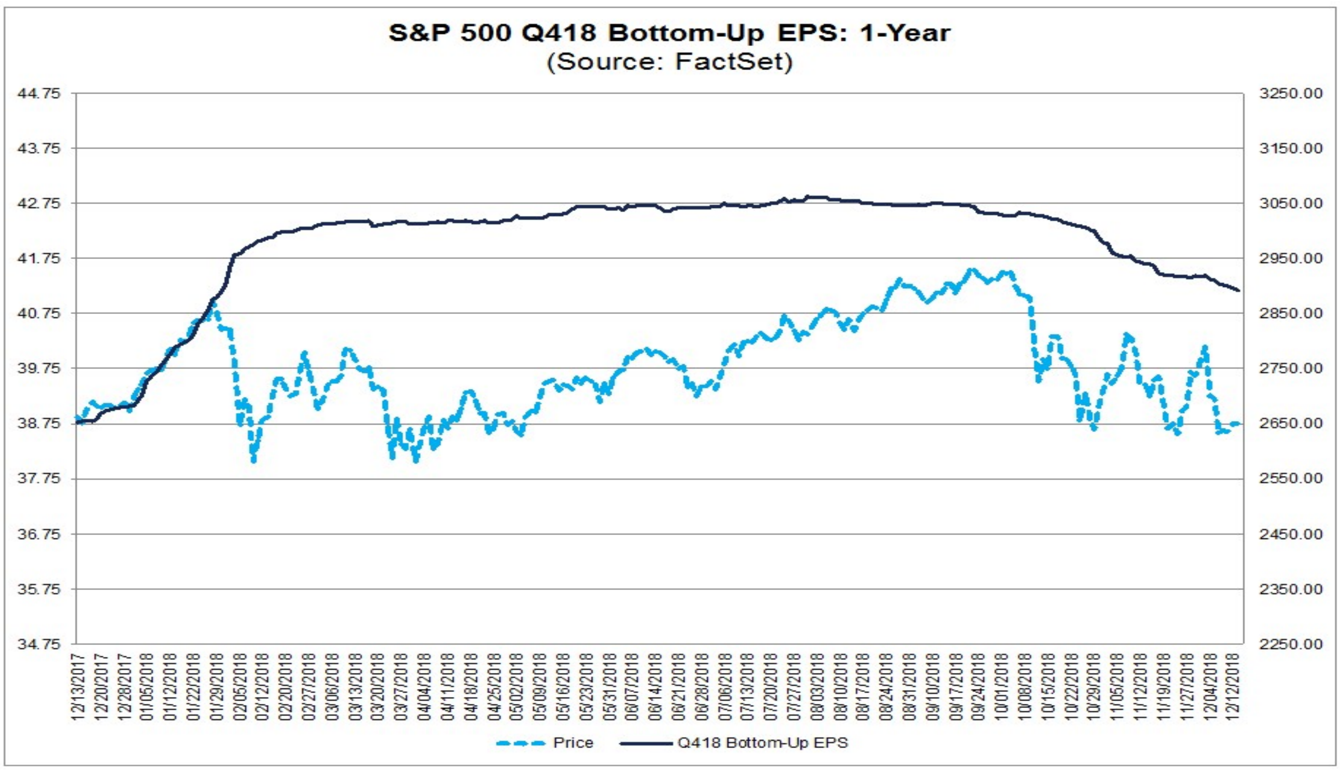




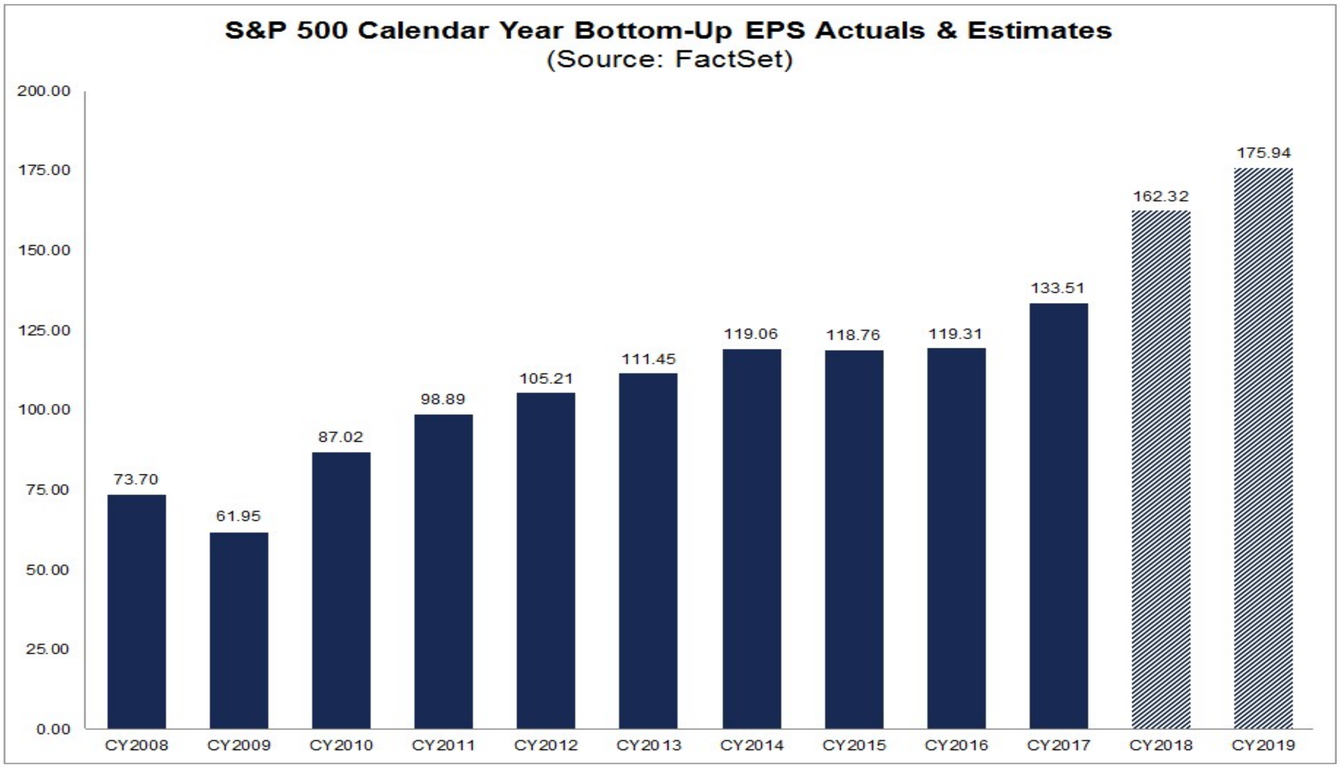
	Utilities	Real Estate	Financials	Consumer Disc.	Comm. Services	Health Care	Industrials	Energy	Consumer Staples	Materials	Info. Technology
International	3%	13%	20%	33%	34%	35%	36%	42%	44%	53%	57%
United States	97%	87%	80%	67%	66%	65%	64%	58%	56%	47%	43%

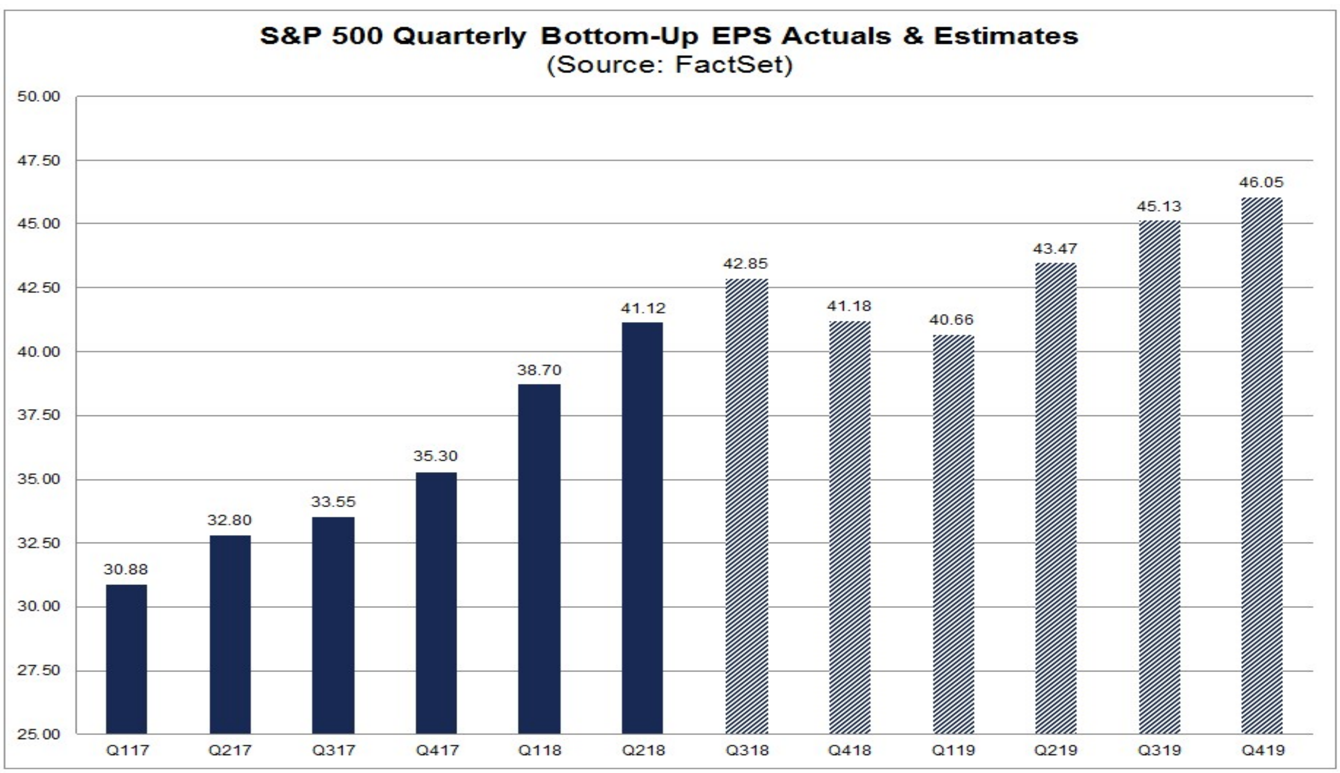
Bottom-up EPS Estimates: Revisions



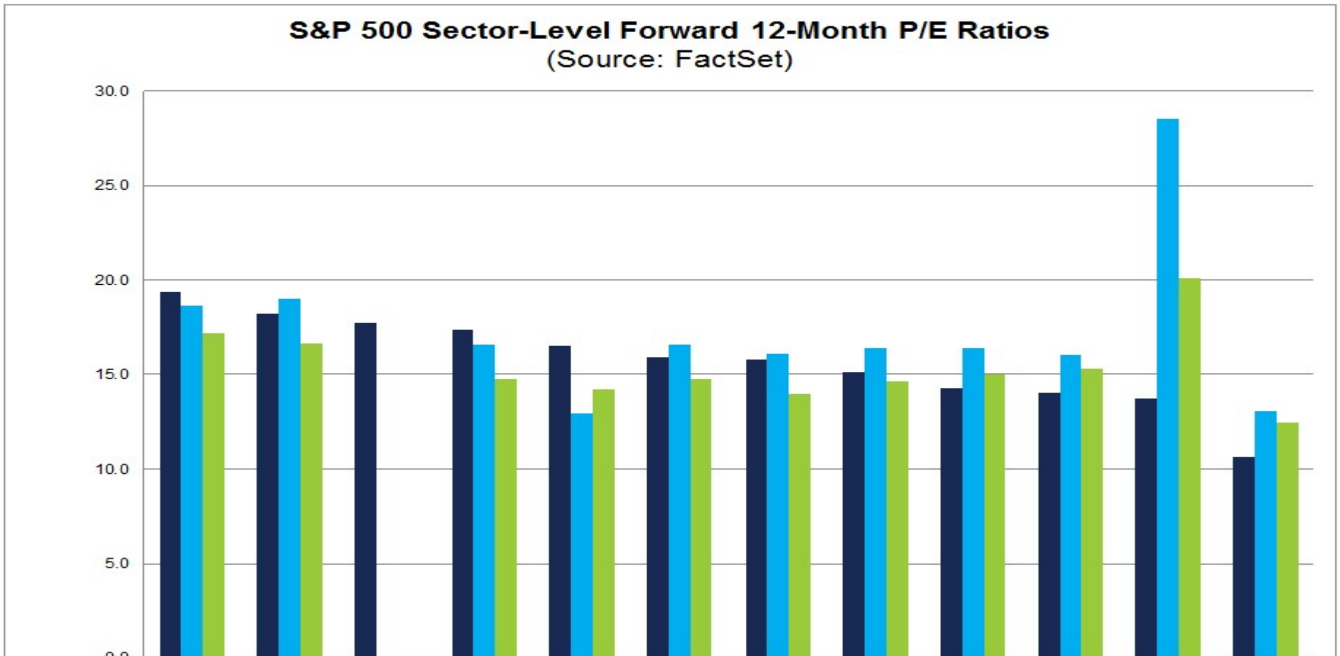


Bottom-up EPS Estimates: Current & Historical

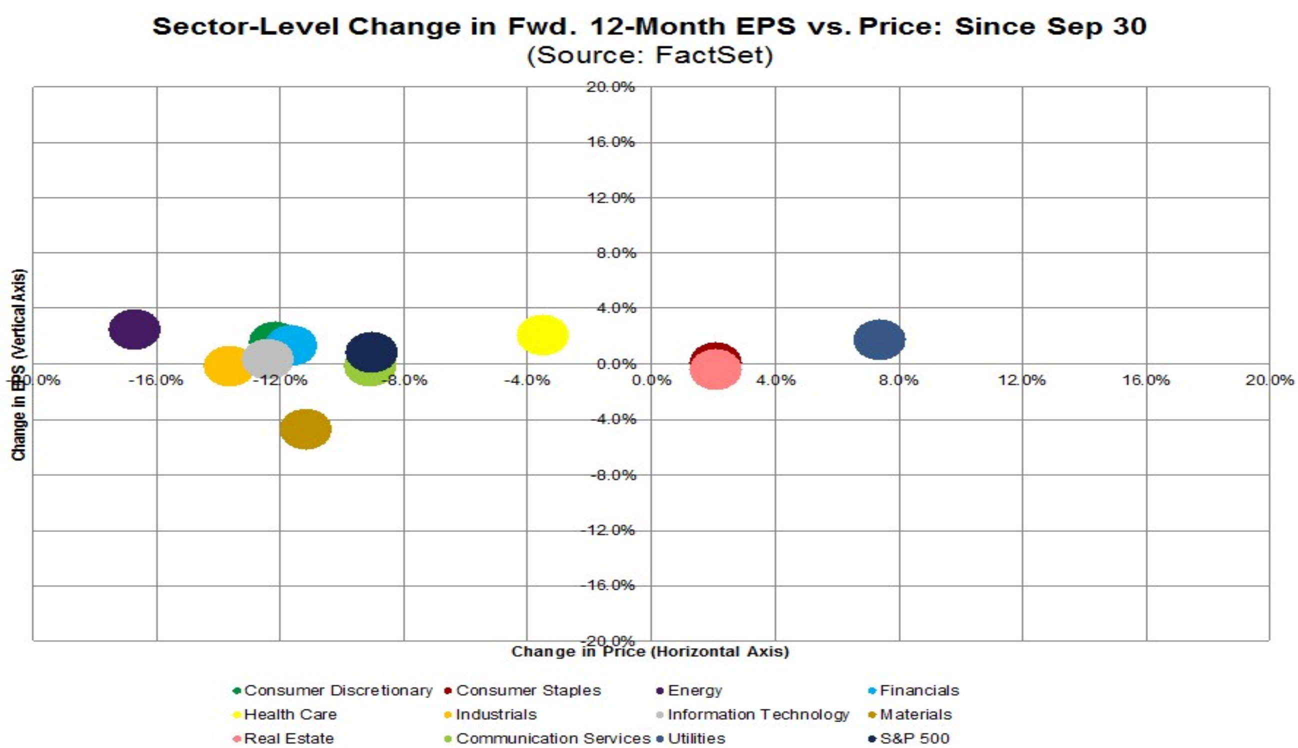




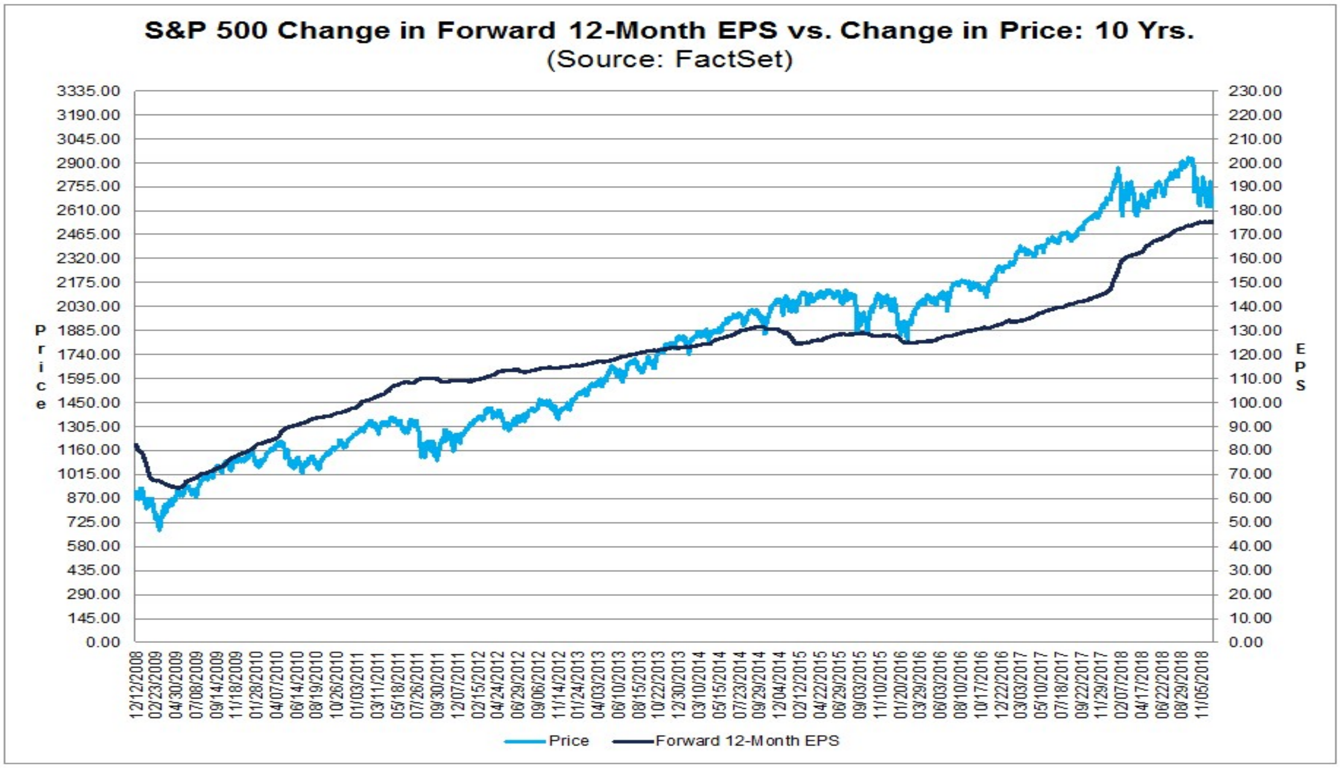
Forward 12M P/E Ratio: Sector Level

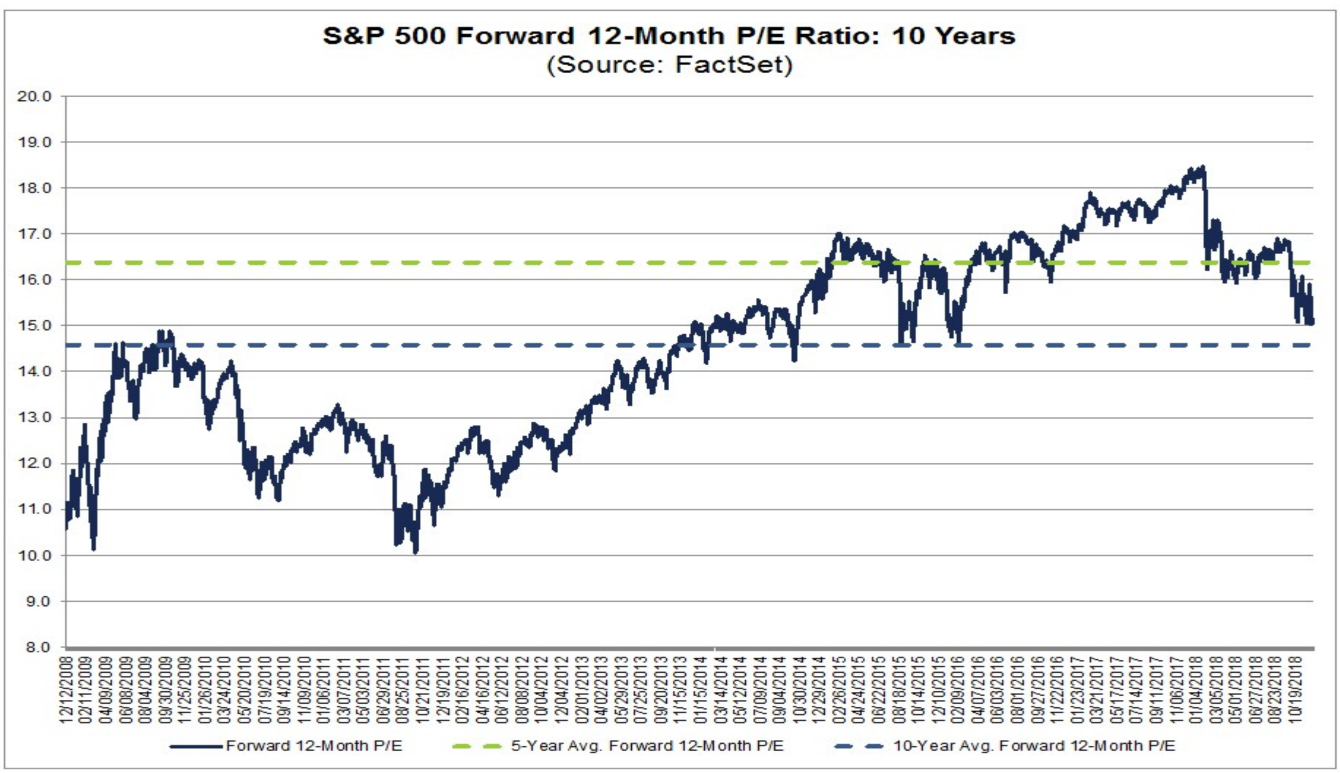


	Consumer Disc.	Consumer Staples	Real Estate	Utilities	Comm. Services	Info. Technology	Health Care	S&P 500	Industrials	Materials	Energy	Financials
Fwd P/E	19.3	18.2	17.7	17.4	16.5	15.9	15.8	15.1	14.3	14.0	13.7	10.6
5-Yr Avg.	18.6	19.0		16.5	13.0	16.6	16.1	16.4	16.4	16.0	28.5	13.1
10-Yr Avg.	17.2	16.6		14.7	14.2	14.7	13.9	14.6	15.0	15.3	20.1	12.5

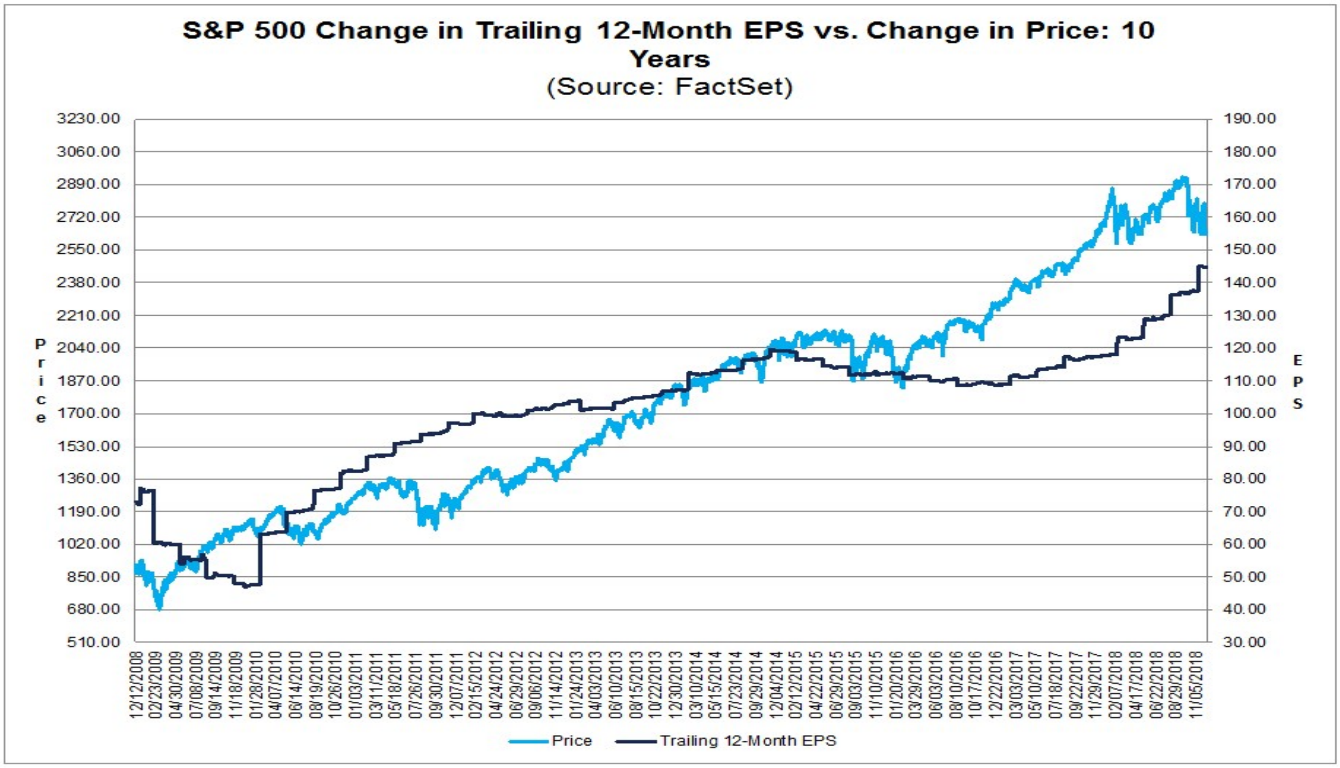


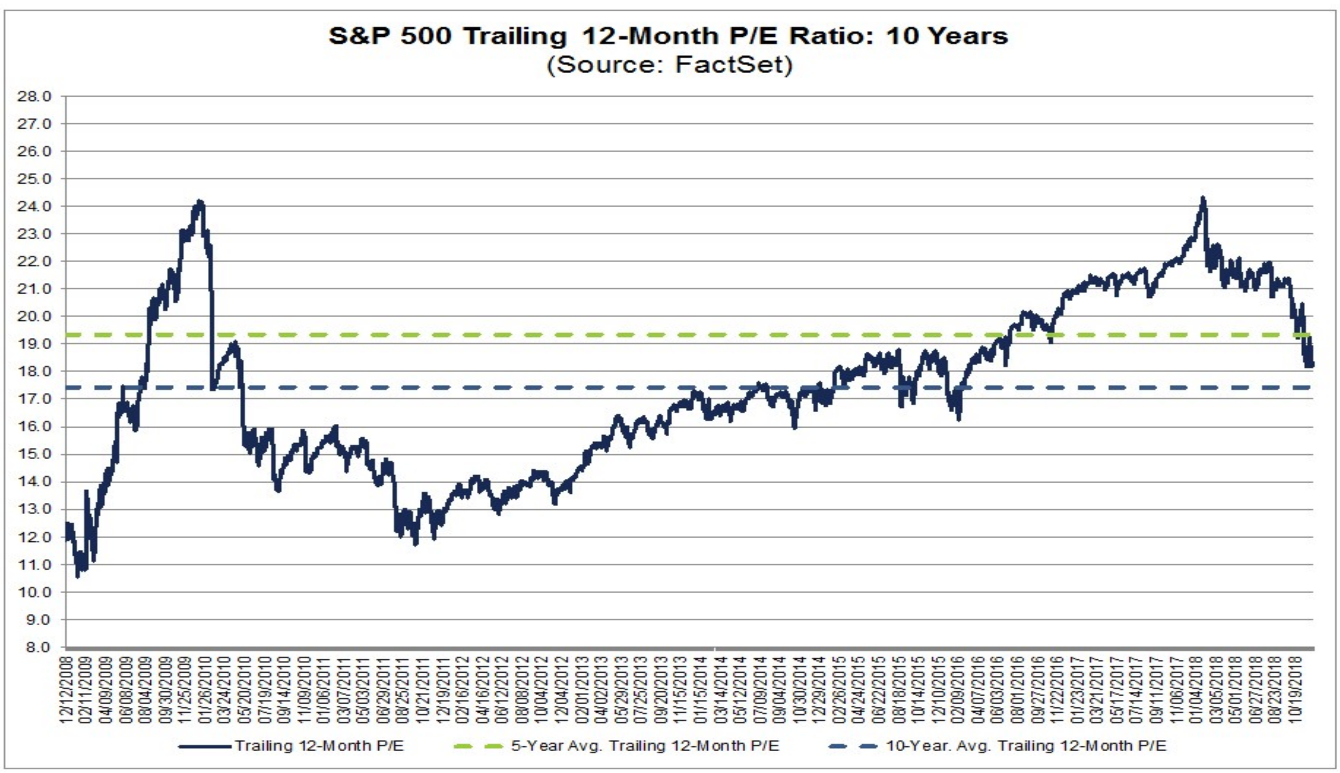
Forward 12M P/E Ratio: Long-Term Averages



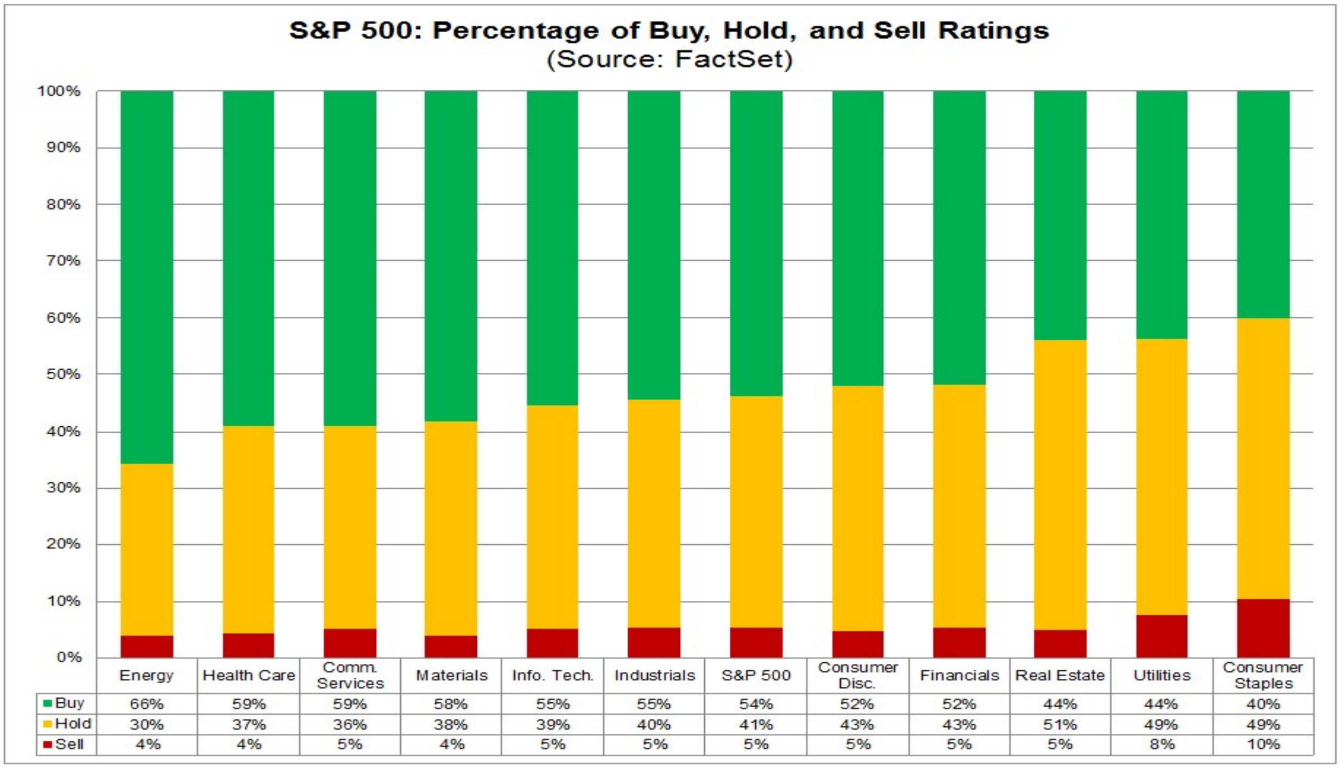


Trailing 12M P/E Ratio: Long-Term Averages

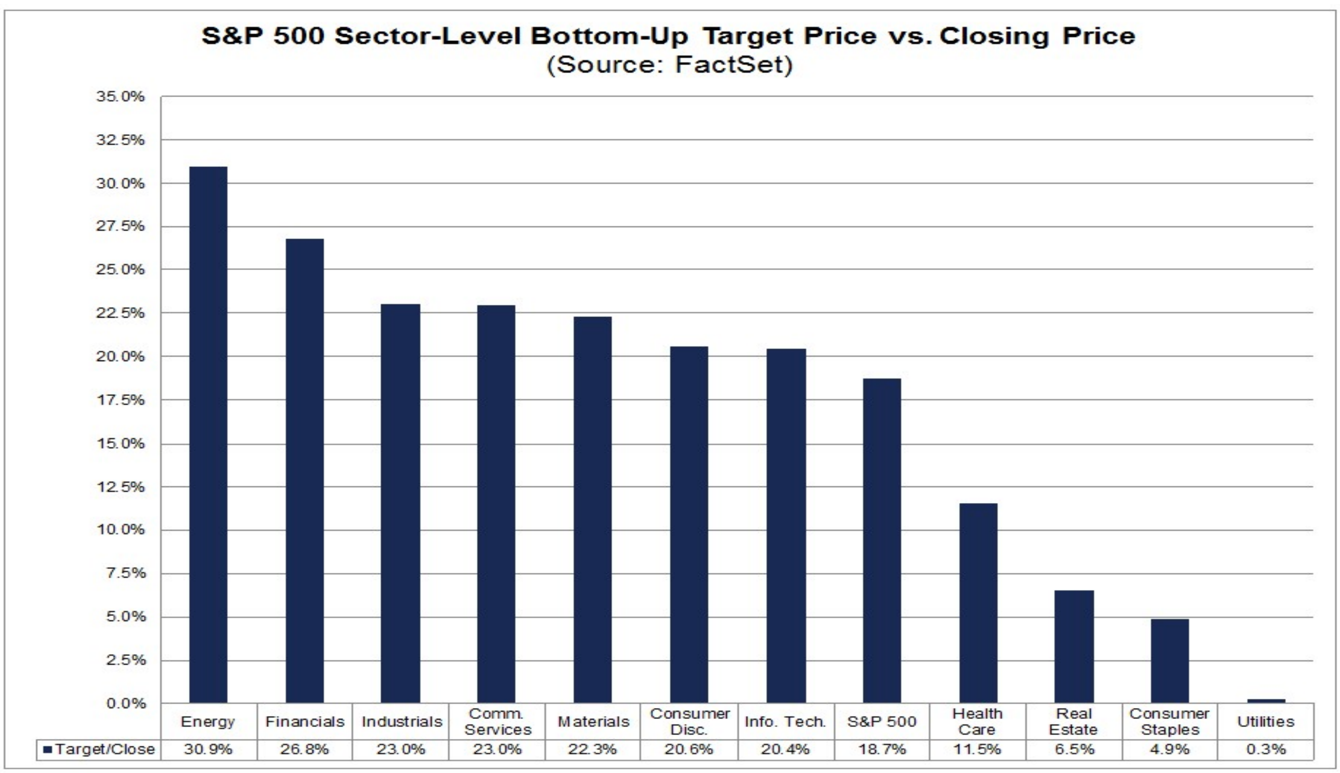




Targets & Ratings



	Energy	Health Care	Comm. Services	Materials	Info. Tech.	Industrials	S&P 500	Consumer Disc.	Financials	Real Estate	Utilities	Consumer Staples
Buy	66%	59%	59%	58%	55%	55%	54%	52%	52%	44%	44%	40%
Hold	30%	37%	36%	38%	39%	40%	41%	43%	43%	51%	49%	49%
Sell	4%	4%	5%	4%	5%	5%	5%	5%	5%	5%	8%	10%



	Energy	Financials	Industrials	Comm. Services	Materials	Consumer Disc.	Info. Tech.	S&P 500	Health Care	Real Estate	Consumer Staples	Utilities
Target/Close	30.9%	26.8%	23.0%	23.0%	22.3%	20.6%	20.4%	18.7%	11.5%	6.5%	4.9%	0.3%

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Quarterly Report on Federal Reserve Balance Sheet Developments

November 2018

BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM

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Board of Governors of the Federal Reserve System

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Purpose

The Federal Reserve prepares this quarterly report as part of its efforts to enhance transparency about its balance sheet, financial information, and monetary policy tools, and to ensure appropriate accountability to the Congress and the public.[1]

The appendix of this report contains information about the transparency provisions of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 (Dodd-Frank Act) and the Federal Reserve's compliance with those provisions.

For prior editions of this report (which was published from June 2009 to August 2012 as the "Monthly Report on Credit and Liquidity Programs and the Balance Sheet") and other resources, please visit the Board's public website at www.federalreserve.gov/monetarypolicy/clbsreports.htm.

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[1] Financial information in this report has not been audited. Financial data are audited annually and are available at www.federalreserve.gov/monetarypolicy/bst_fedfinancials.htm.

Contents

Abbreviations

CAMELS	Capital, Assets, Management, Earnings, Liquidity, and Sensitivity
CMO	Collateralized mortgage obligations
FCB	Foreign central bank
FOMC	Federal Open Market Committee
FRBNY	Federal Reserve Bank of New York
GSE	Government-sponsored enterprise
LLC	Limited liability company
LSAP	Large-scale asset purchase program
MBS	Mortgage-backed securities
OMO	Open market operation
RRP	Reverse repurchase agreement
SOMA	System Open Market Account
TAF	Term Auction Facility
TDF	Term Deposit Facility

Overview

Recent Developments

The Overview section of this report highlights recent developments in the operations of the Federal Reserve's monetary policy tools and presents data describing changes in the assets, liabilities, and total capital of the Federal Reserve System as of October 24, 2018.

FOMC Raises Target Range for the Federal Funds Rate; Federal Reserve Takes Associated and Related Implementation Steps

- On September 26, 2018, the Federal Open Market Committee (FOMC) announced that it had decided to raise the target range for the federal funds rate to 2 to 2-1/4 percent, from 1-3/4 to 2 percent. Additional information on the FOMC's decision is available at www.federalreserve.gov/newsevents/pressreleases/monetary20180926a.htm and www.federalreserve.gov/newsevents/pressreleases/monetary20181017a.htm.
- To implement this monetary policy stance, the FOMC directed the Federal Reserve Bank of New York (FRBNY) to conduct open market operations (OMOs), including overnight reverse repurchase operations, as necessary to maintain the federal funds rate in a target range of 2 to 2-1/4 percent. In related actions, effective September 27, 2018, the Board of Governors of the Federal Reserve System (Board) raised the interest rate paid on required and excess reserve balances to 2.20 percent and approved a 1/4 percentage point increase in the discount rate (the primary credit rate) to 2.75 percent.
- In addition, the FOMC directed the FRBNY to continue rolling over at auction the amount of principal payments from the Federal Reserve's holdings of Treasury securities maturing during September that exceeded $24 billion and to continue reinvesting in agency mortgage-backed securities (MBS) the amount of principal payments from the Federal Reserve's holdings of agency debt and agency MBS received during September that exceeded $16 billion. Effective in October 2018, the FOMC directed the FRBNY to increase these principal payment reinvestment thresholds to $30 billion per calendar month for Treasury securities and $20 billion per calendar month for agency debt and agency MBS. Small deviations from these amounts for operational reasons are acceptable. Additional information on these implementation steps is available at www.federalreserve.gov/newsevents/pressreleases/monetary20180926a1.htm and www.newyorkfed.org/markets/rrp_op_policies.html.

FRBNY Completes Sales of Securities in Maiden Lane LLC Portfolio

- On September 18, 2018, the FRBNY announced the completion of the sale of the remaining securities in the portfolio of Maiden Lane LLC (ML LLC), a limited liability corporation formed by the FRBNY in 2008 to acquire certain assets of The Bear Stearns Companies, Inc. Net proceeds from sales of ML LLC assets, as well as interest paid by ML LLC to the FRBNY, provided a net gain of approximately $2.5 billion for the benefit of the U.S. public. Additional information is available at www.newyorkfed.org/newsevents/news/markets/2018/an180918.html.

Federal Reserve Board Publishes Quarterly Financial Report

- On November 16, 2018, the Federal Reserve System published the "Federal Reserve Banks Combined Quarterly Financial Report" for the third quarter of 2018, which includes summary information on the combined financial position and results of operations of the 12 Reserve Banks. All financial information included in the report is unaudited. The report is available on the Federal

Reserve Board's website at www.federalreserve.gov/aboutthefed/combined-quarterly-financial-reports-unaudited.htm.

Federal Reserve System Assets, Liabilities, and Total Capital

Table 1 reports selected assets, liabilities, and total capital of the Federal Reserve System and presents the change in these components over selected intervals. The Federal Reserve publishes its complete balance sheet each week in the H.4.1 statistical release, "Factors Affecting Reserve Balances of Depository Institutions and Condition Statement of Federal Reserve Banks," available at www.federalreserve.gov/releases/h41/.

Figure 1 displays the levels of selected Federal Reserve assets and liabilities, securities holdings, and credit extended through liquidity facilities since April 2010.

Table 1. Assets, liabilities, and capital of the Federal Reserve System
Billions of dollars

Item	Current October 24, 2018	Change from July 25, 2018	Change from October 25, 2017
Total assets	**4,173**	**–105**	**–288**
Selected assets			
Securities held outright	3,974	–98	–269
U.S. Treasury securities[1]	2,294	–66	–172
Federal agency debt securities[1]	2	0	–4
Mortgage-backed securities[2]	1,677	–33	–94
Memo: Overnight securities lending[3]	16	–2	–9
Memo: Net commitments to purchase mortgage-backed securities[4]	3	–5	–15
Unamortized premiums on securities held outright[5]	144	–5	–18
Unamortized discounts on securities held outright[5]	–14	+*	1
Lending to depository institutions[6]	*	–*	+*
Central bank liquidity swaps[7]	*	–*	+*
Net portfolio holdings of Maiden Lane LLC[8]	*	-2	-2
Foreign currency denominated assets[9]	21	–*	–*
Total liabilities	**4,134**	**–105**	**–286**
Selected liabilities			
Federal Reserve notes in circulation	1,643	22	106
Reverse repurchase agreements[10]	226	–24	–122
Foreign official and international accounts[10]	219	–30	–16
Others[10]	6	6	–106
Term deposits held by depository institutions	0	0	–14
Other deposits held by depository institutions	1,825	–122	–417
U.S. Treasury, General Account	361	22	176
Other deposits[11]	68	–3	–14
Total capital	**39**	**+***	**–2**

Note: Unaudited. Components may not sum to totals because of rounding.

* Less than $500 million.

1 Face value.

2 Guaranteed by Fannie Mae, Freddie Mac, and Ginnie Mae. The current face value shown is the remaining principal balance of the securities.

3 Securities loans under the overnight facility are off-balance-sheet transactions. These loans are shown here as a memo item to indicate the portion of securities held outright that have been lent through this program.

4 Current face value. Includes commitments associated with outright purchases, dollar rolls, and coupon swaps.

5 Reflects the premium or discount, which is the difference between the purchase price and the face value of the securities that has not been amortized. For U.S. Treasury securities, federal agency debt securities, and mortgage-backed securities, amortization is on an effective-interest basis.

6 Total of primary, secondary, and seasonal credit.

7 Dollar value of the foreign currency held under these agreements valued at the exchange rate to be used when the foreign currency is returned to the foreign central bank. This exchange rate equals the market exchange rate used when the foreign currency was acquired from the foreign central bank.

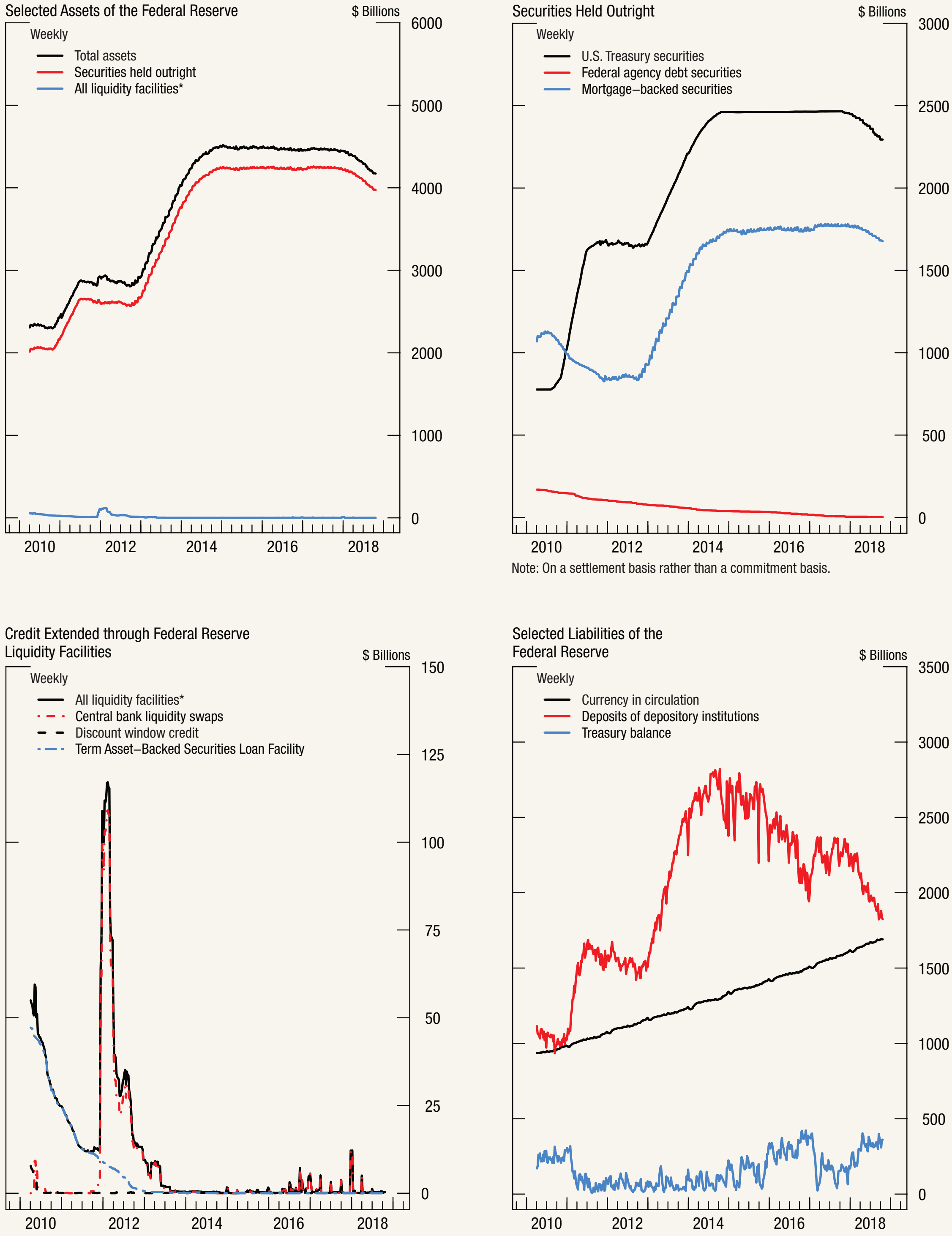
8 Fair value. Fair value reflects an estimate of the price that would be received upon selling an asset if the transaction were to be conducted in an orderly market on the measurement date. Assets are revalued quarterly.

9 Revalued daily at current foreign currency exchange rates.

10 Cash value of agreements, which are collateralized by U.S. Treasury securities, federal agency debt securities, and mortgage-backed securities.

11 Includes deposits held at the Reserve Banks by international and multilateral organizations, government-sponsored enterprises, designated financial market utilities, and deposits held by depository institutions in joint accounts in connection with their participation in certain private-sector payment arrangements. Also includes certain deposit accounts other than the U.S. Treasury, General Account, for services provided by the Reserve Banks as fiscal agents of the United States.

Figure 1. Credit and liquidity programs and the Federal Reserve's balance sheet



Note: Data are shown through October 24, 2018.
*All liquidity facilities includes primary credit, secondary credit, seasonal credit, Term Asset–Backed Securities Loan Facility, and central bank liquidity swaps.

Monetary Policy Tools

The Federal Reserve currently uses several tools to implement monetary policy in support of its statutory mandate to foster maximum employment and stable prices.

The Federal Reserve conducts OMOs in domestic markets. OMOs can be permanent, including the outright purchase and sale of Treasury securities, government-sponsored enterprise (GSE) debt securities, and federal agency and GSE MBS; or temporary, including the purchase of these securities under agreements to resell, and the sale of these securities under agreements to repurchase. The authority to conduct OMOs is granted under section 14 of the Federal Reserve Act, and the range of securities that the Federal Reserve is authorized to purchase and sell is relatively limited. OMOs are conducted by the FRBNY's Trading Desk, which acts as agent for the FOMC. The FRBNY's traditional counterparties for OMOs are the primary dealers with which the FRBNY trades U.S. government and select other securities.[2] Since 2009, the FRBNY has designated other counterparties for certain OMO programs.

OMOs have been used historically to adjust the supply of reserve balances so as to keep the federal funds rate around the target federal funds rate established by the FOMC. In recent years, the Federal Reserve has also developed other tools to strengthen its control of short-term interest rates and to reduce the large quantity of reserves held by the banking system.

The Federal Reserve provides short-term liquidity to domestic banks and other depository institutions through the discount window. In addition, because of the global nature of bank funding markets, the Federal Reserve has established liquidity arrangements with foreign central banks (FCBs) as part of coordinated international efforts.

Permanent Open Market Operations

Recent Developments

- On September 26, 2018, the FOMC directed the FRBNY to roll over at auction the amount of principal payments from the Federal Reserve's holdings of Treasury securities maturing during each calendar month that exceeds $30 billion and to reinvest in agency MBS the amount of principal payments from the Federal Reserve's holdings of agency debt and agency MBS received during each calendar month that exceeds $20 billion, effective in October 2018. Small deviations from these amounts for operational reasons are acceptable. Additional information is available at www.federalreserve.gov/newsevents/pressreleases/monetary20180926a1.htm.
- Between July 25, 2018, and October 24, 2018, the System Open Market Account's (SOMA) holdings of Treasury securities and agency MBS declined under the FOMC's balance sheet normalization program initiated in October 2017.

Background

Permanent OMOs are outright purchases or sales of securities for the SOMA, the Federal Reserve's portfolio. Traditionally, permanent OMOs have been used to accommodate the longer-term factors driving the expansion of the Federal Reserve's balance sheet, principally the trend growth of currency in circulation. From 2009 to 2014, permanent OMOs were used to expand SOMA securities holdings through a

2 A current list of primary dealers, along with the FRBNY's expectations and requirements of them, is available on the FRBNY's website at www.newyorkfed.org/markets/primarydealers.html. Information on the FRBNY's administration of its relationships with primary dealers and other counterparties for market operations—including requirements for business standards, financial condition and supervision, and compliance and controls—is available at www.newyorkfed.org/markets/counterparties/policy-on-counterparties-for-market-operations.

series of large-scale asset purchase programs (LSAPs) and to extend the average maturity of securities held in the SOMA.[3]

Currently, permanent OMOs are used to implement the FOMC's policy of reinvesting principal payments from its holdings of agency debt and MBS in agency MBS and of rolling over maturing Treasury securities at auction. As described in more detail below, beginning in October 2017 these reinvestments are being reduced under the FOMC's program to normalize the size of the Federal Reserve's balance sheet. In addition, as a matter of prudent planning the FRBNY Trading Desk occasionally conducts small-value exercises, including outright purchases and sales of Treasury securities, outright purchases and sales of MBS, and MBS coupon swaps, for the purpose of testing operational readiness.

The composition of the SOMA is presented in table 2. The Federal Reserve's outright holdings of securities are reported weekly in tables 1, 2, 3, 5, and 6 of the H.4.1 statistical release.

On September 28, 2012, the Federal Reserve began the regular publication of transaction-level information on individual open market transactions. In accordance with the Dodd-Frank Act, this information will be made available on a quarterly basis and with an approximately two-year lag. The transaction-level detail supplements the extensive aggregate information the Federal Reserve has previously provided in weekly, monthly, and quarterly reports, and is available at www.newyorkfed.org/markets/OMO_transaction_data.html.

Balance Sheet Normalization

From 2009 to 2014, the FOMC undertook a large expansion of SOMA securities holdings through a series of LSAPs that were conducted in order to support the housing market, improve conditions in private credit markets, and promote a stronger pace of economic recovery.[4] In October 2017, the FOMC initiated a balance sheet normalization program that will gradually reduce the size of these holdings by decreasing the reinvestment of the principal payments received from securities held in the SOMA.[5] Such principal payments will be reinvested only to the extent that they exceed gradually rising caps.

Table 2. Domestic SOMA securities holdings
Billions of dollars

Security type	Total par value as of October 24, 2018	Total par value as of July 25, 2018
U.S. Treasury bills	*	0
U.S. Treasury notes and bonds, nominal	2,138	2,207
U.S. Treasury floating rate notes	18	18
U.S. Treasury notes and bonds, inflation-indexed[1]	138	135
Federal agency debt securities[2]	2	2
MBS[3]	1,677	1,710
Total SOMA securities holdings	**3,974**	**4,072**

Note: Unaudited. Components may not sum to total because of rounding. Does not include investments denominated in foreign currencies or unsettled transactions.

* Less than $500 million.

1 Includes inflation compensation.

2 Direct obligations of Fannie Mae, Freddie Mac, and the Federal Home Loan Banks.

3 Guaranteed by Fannie Mae, Freddie Mac, and Ginnie Mae. Current face value of the securities, which is the remaining principal balance of the securities.

Initially, for October 2017 to December 2017, the decline in SOMA securities holdings was capped at $6 billion per month for Treasury securities and $4 billion per month for agency debt and agency MBS. These caps were anticipated to gradually rise at three-month intervals to maximums of $30 billion per month for Treasury securities and $20 billion per month for agency debt and agency MBS. Once the caps reached their respective maximums, they were anticipated to remain in place so that the Federal Reserve's securities holdings will continue to decline in a gradual and predictable manner until the Committee judges that the Federal Reserve is holding no more securities than necessary to implement monetary policy efficiently and effectively.

Gradually reducing the Federal Reserve's securities holdings will result in a declining supply of reserve balances. The FOMC anticipates reducing the quantity of reserve balances, over time, to a level appre-

3 Information on the maturity extension program is available at www.federalreserve.gov/monetarypolicy/maturityextensionprogram.htm and www.newyorkfed.org/markets/opolicy/operating_policy_110921.html.

4 Additional information on LSAPs is available at www.federalreserve.gov/monetarypolicy/bst_openmarketops.htm and www.newyorkfed.org/markets/funding_archive/lsap.html.

5 Under the FOMC's previous reinvestment policies all maturing Treasury securities were rolled over at auction, and all principal payments from the SOMA's holdings of agency debt and agency MBS were reinvested in agency MBS (the latter policy was announced in September 2011). These previous policies prevented the Federal Reserve's balance sheet from shrinking when Treasury securities matured and principal payments on agency debt and agency MBS were received.

ciably below that seen in recent years but larger than before the financial crisis; the level will reflect the banking system's demand for reserve balances and the FOMC's decisions about how to implement monetary policy most efficiently and effectively in the future. In addition, decreasing the size of the balance sheet in a gradual and predictable manner will limit the volume of securities that private investors will have to absorb and will guard against outsized moves in interest rates and other potential market strains. Additional information on the balance sheet normalization program is available at www.federalreserve.gov/monetarypolicy/policy-normalization.htm.

Temporary Open Market Operations and Other Reserve Management Tools

Recent Developments

- To implement its monetary policy stance announced on September 26, 2018, the FOMC directed the FRBNY to conduct OMOs, including overnight reverse repurchase operations, as necessary to maintain the federal funds rate in a target range of 2 to 2-1/4 percent.
- On October 24, 2018, outstanding reverse repurchase agreements (RRPs or reverse repos) conducted under OMOs totaled $6.4 billion. This amount is shown in table 1 as reverse repurchase agreements with others. Outstanding RRPs from these operations ranged from less than $0.01 billion to $48.4 billion during the period from July 25, 2018, to October 24, 2018. Additional information is available at www.newyorkfed.org/markets/rrp_op_policies.html and www.newyorkfed.org/markets/rrp_faq.html, and the results of the operations are available at www.newyorkfed.org/markets/omo/dmm/temp.cfm.
- As part of ongoing test operations, the Federal Reserve conducted a Term Deposit Facility (TDF) offering on August 23, 2018. The operation offered seven-day floating rate deposits with an early withdrawal feature, maximum individual award amounts of $250 million, and rates set equal to the sum of the interest rate on excess reserves plus a fixed spread of 1 basis point. The ongoing TDF test operations are a matter of prudent planning and have no implications for the near-term conduct of monetary policy. Results of the operation are available at www.federalreserve.gov/monetarypolicy/tdf.htm.

Repos and Reverse Repos

Temporary OMOs are typically used to address reserve needs that are deemed to be transitory in nature. These operations are either repurchase agreements (repos) or reverse repos. Under a repo, the FRBNY Trading Desk buys a security under an agreement to resell that security in the future. A repo is the economic equivalent of a collateralized loan from the Federal Reserve to a primary dealer (the Federal Reserve counterparty in repo operations) and increases bank reserves while the trade is outstanding. The difference between the purchase and sale prices reflects the interest on the loan. Other than occasional test operations, the FRBNY has not conducted a repo since December 2008.

Under a reverse repo, the Trading Desk sells a security from the SOMA under an agreement to repurchase that security in the future. A reverse repo is the economic equivalent of collateralized borrowing by the Federal Reserve from a reverse repo counterparty and reduces bank reserves while the trade is outstanding. The securities temporarily sold under the agreement continue to be shown as assets held by the SOMA in accordance with generally accepted accounting principles. Reverse repos are a tool that is used to manage money market interest rates and provide the Federal Reserve with greater control over short-term rates.

In December 2009, the FRBNY began conducting small-scale reverse repo test operations with primary dealers as a matter of prudent advance planning. Reverse repo test operations were gradually expanded to include a larger group of counterparties (which is described in more detail below), and terms varying from overnight up to about four weeks. From September 2013 to December 2015, the FRBNY conducted a series of overnight reverse repos as a technical exercise for the purpose of further assessing the appropriate structure of such operations in supporting the implementation of monetary policy during normalization. Since the commencement of the monetary policy normalization process in December 2015, the FOMC has authorized the FRBNY to conduct OMOs, including reverse repos, as necessary to maintain the federal funds rate in its target range. Additional information is available at www.newyorkfed.org/markets/

rrp_op_policies.html and www.newyorkfed.org/markets/rrp_faq.html, and the results of the operations are available at www.newyorkfed.org/markets/omo/dmm/temp.cfm.

Repo and reverse repo operations are conducted as competitive auctions or as full-allotment operations in which participants' bids are awarded in full up to a maximum amount at a fixed rate. Amounts outstanding under repos and reverse repos are reported weekly in tables 1, 2, 5, and 6 of the H.4.1 statistical release.

Expanded Counterparties for Reverse Repos

The FRBNY conducts reverse repos with an expanded set of counterparties that includes entities other than primary dealers. This enhances the Federal Reserve's capacity to conduct large-scale reverse repo operations to drain reserves. The additional counterparties are not eligible to participate in transactions conducted by the FRBNY other than reverse repos. The set of expanded counterparties includes domestic money market funds, GSEs, and banks, and is expected to remain around 150 in number. The FRBNY may amend the list of counterparties at its discretion.

Acceptance as a counterparty is not an endorsement of the firm by the FRBNY and should not be used as a substitute for independent analysis and due diligence by other parties considering a business relationship with the firm. Further information on reverse repo counterparties is available on the FRBNY's website at www.newyorkfed.org/markets/rrp_announcements.html, www.newyorkfed.org/markets/rrp_counterparties.html, and www.newyorkfed.org/markets/counterparties/policy-on-counterparties-for-market-operations.

Reverse Repos with Foreign Official and International Accounts

The Federal Reserve has long operated an overnight reverse repo facility as a service for FCBs and international account holders that choose to hold a portion of their dollar assets at the FRBNY.[6] Facility participants invest their cash balances with the FRBNY using securities in the SOMA as collateral, at an interest rate that is derived from comparable market-based rates. While reverse repos conducted under this facility are separate from monetary policy operations such as the overnight and term reverse repo operations described above, they also result in a corresponding decrease in reserves. Amounts outstanding under reverse repos to foreign official and international accounts are shown in table 1. Additional information is available at www.newyorkfed.org/aboutthefed/fedpoint/fed20.

Term Deposit Facility

The Term Deposit Facility (TDF) is a program through which the Federal Reserve Banks offer interest-bearing term deposits to eligible institutions. A term deposit is a deposit at a Federal Reserve Bank with a specific maturity date. The TDF was established to facilitate the conduct of monetary policy by providing a tool that may be used to manage the aggregate quantity of reserve balances held by depository institutions and, in particular (as with reverse repos), to support a reduction in monetary accommodation at the appropriate time. An increase in term deposits outstanding drains reserve balances because funds to pay for them are removed from the accounts of participating institutions for the life of the term deposit.

Term deposits may be awarded either through (1) a competitive single-price auction with a noncompetitive bidding option (which allows institutions to place small deposits at the rate determined in the competitive portion of the operation), (2) a fixed-rate format with full allotment up to a maximum tender amount at an interest rate specified in advance, or (3) a floating-rate format with full allotment up to a maximum tender amount at an interest rate set equal to the sum of the interest rate paid on excess reserves plus a fixed spread. Since September 2014, term deposits have incorporated an early withdrawal feature that allows depositors to obtain a return of funds prior to the maturity date subject to an early withdrawal penalty.

Beginning in June 2010, the Federal Reserve has periodically conducted TDF test offerings as a matter of prudent planning. These offerings are designed to ensure the operational readiness of the TDF and to provide eligible institutions with an opportunity to gain familiarity with term deposit procedures; the operations have no implications for the near-term conduct of monetary policy. Additional information about term deposits, auction results, and future test operations is available through the TDF Resource Center at www.frbservices.org/central-bank/reserves-central/term-deposit-facility/index.html.

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[6] Analogous services are offered by other major central banks.

Securities Lending Program

The Federal Reserve has long operated an overnight securities lending facility as a vehicle to address market pressures for specific Treasury securities. Since July 9, 2009, this facility has also lent housing-related GSE debt securities that are particularly sought after. Amounts outstanding under this facility are reported weekly in table 1A of the H.4.1 statistical release. Additional information on the Securities Lending program is available at www.newyorkfed.org/markets/sec_faq.html.

Discount Window Lending

Recent Developments

- Credit provided to depository institutions through the discount window generally remained around its usual level. As presented in table 5, discount window credit outstanding on October 24, 2018, was $0.2 billion, and the lendable value of collateral pledged by borrowing institutions on that date was $1.7 billion.
- Effective September 27, 2018, the Board approved a 1/4 percentage point increase in the primary credit rate, to 2.75 percent.

Background

The discount window helps to relieve liquidity strains for individual depository institutions and for the banking system as a whole by providing a source of funding in times of need. Much of the statutory framework that governs lending to depository institutions is contained in section 10B of the Federal Reserve Act, as amended. The general policies that govern discount window lending are set forth in the Federal Reserve Board's Regulation A.

Depository institutions have, since 2003, had access to three types of discount window credit: primary credit, secondary credit, and seasonal credit. Primary credit is available to depository institutions in generally sound financial condition with few administrative requirements, at an interest rate that is 50 basis points above the FOMC's target rate for federal funds. Secondary credit may be provided to depository institutions that do not qualify for primary credit, subject to review by the lending Reserve Bank, at an interest rate that is 50 basis points above the rate on primary credit. Seasonal credit provides short-term funds to smaller depository institutions that experience regular seasonal swings in loans and deposits. The interest rate on seasonal credit is a floating rate based on market funding rates.

On September 28, 2012, the Federal Reserve began the regular publication of detailed information on individual discount window loans. In accordance with the Dodd-Frank Act, this information will be made available on a quarterly basis and with an approximately two-year lag. The disclosure includes the name and identifying details of the depository institution, the amount borrowed, the interest rate paid, and information identifying the types and amount of collateral pledged. This detailed information supplements the extensive aggregate information the Federal Reserve has previously provided in weekly, monthly, and quarterly reports, and is available on the Federal Reserve's public website at www.federalreserve.gov/newsevents/reform_quarterly_transaction.htm.

During the financial crisis that began in 2007, the Federal Reserve modified the terms and conditions of the discount window lending programs in order to promote orderly market functioning. Information about these actions is available on the Federal Reserve's public website at www.federalreserve.gov/monetarypolicy/bst_crisisresponse.htm and www.frbdiscountwindow.org.

Table 3. Discount window credit outstanding to depository institutions

Daily average borrowing for each class of borrower July 26, 2018, to October 24, 2018

Type and size of borrower	Average number of borrowers[1]	Average borrowing ($ billions)[2]
Commercial banks[3]		
Assets: more than $50 billion	*	**
Assets: $5 billion to $50 billion	*	**
Assets: $250 million to $5 billion	9	0.1
Assets: less than $250 million	37	0.2
Thrift institutions and credit unions	6	**
Total	**52**	**0.3**

Note: Unaudited. Includes primary, secondary, and seasonal credit. Size categories based on total domestic assets from Call Report data as of June 30, 2018. Components may not sum to totals because of rounding.

* Fewer than one borrower.

** Less than $50 million.

1 Average daily number of depository institutions with credit outstanding. Over this period, a total of 614 institutions borrowed.

2 Average daily borrowing by all depositories in each category.

3 Includes branches and agencies of foreign banks.

Table 4. Concentration of discount window credit outstanding to depository institutions
July 26, 2018, to October 24, 2018

Rank by amount of borrowing	Number of borrowers	Daily average borrowing ($ billions)
Top five	5	0.1
Next five	5	*
Other	42	0.1
Total	**52**	**0.3**

Note: Unaudited. Amount of primary, secondary, and seasonal credit extended to the top five and other borrowers on each day, as ranked by daily average borrowing. Components may not sum to totals because of rounding.

* Less than $50 million.

In extending credit through the discount window, the Federal Reserve closely monitors the financial condition of depository institutions using a four-step process designed to minimize the risk of loss to the Federal Reserve posed by weak or failing borrowers. The first step is monitoring, on an ongoing basis, the safety and soundness of all depository institutions that access or may access the discount window and the payment services provided by the Federal Reserve. The second step is identifying institutions whose condition, characteristics, or affiliation would present higher-than-acceptable risk to the Federal Reserve in the absence of controls on their access to Federal Reserve lending facilities and other Federal Reserve services. The third step is communicating—to staff within the Federal Reserve System and to other supervisory agencies, if and when necessary—relevant information about those institutions identified as posing higher risk. The fourth step is implementing appropriate measures to mitigate the risks posed by such entities.

At the heart of the condition-monitoring process is an internal rating system that provides a framework for identifying institutions that may pose undue risks to the Federal Reserve. The rating system relies mostly on information from each institution's primary supervisor, including CAMELS ratings, to identify potentially problematic institutions and classify them according to the severity of the risk they pose to the Federal Reserve.[7] Having identified institutions that pose a higher risk, the Federal Reserve then puts in place a standard set of risk controls that become increasingly stringent as the risk posed by an institution grows; individual Reserve Banks may implement additional risk controls to further mitigate risk if they deem it necessary.

7 CAMELS (Capital, Assets, Management, Earnings, Liquidity, and Sensitivity) is a rating system employed by banking regulators to assess the soundness of commercial banks and thrifts. Similar rating systems are used for other types of depository institutions.

Table 5. Lendable value of collateral pledged by borrowing depository institutions
Billions of dollars, as of October 24, 2018

Type of collateral	Lendable value
Loans	
Commercial	0.2
Residential mortgage	0.1
Commercial real estate	0.1
Consumer	0.6
Securities	
U.S. Treasury/agency	0.3
Municipal	0.1
Corporate market instruments	*
MBS/CMO: agency-guaranteed	0.2
MBS/CMO: other	0
Asset-backed	*
International (sovereign, agency, municipal, and corporate)	0
Other	
Term Deposit Facility deposits	0
Total	**1.7**

Note: Unaudited. Collateral pledged by borrowers of primary, secondary, and seasonal credit as of the date shown. Total primary, secondary, and seasonal credit on this date was $0.2 billion. The lendable value of collateral pledged by all depository institutions, including those without any outstanding loans, was $1,584 billion. Lendable value is value after application of appropriate haircuts. Components may not sum to total because of rounding.

* Less than $50 million.

Collateral

All extensions of discount window credit by the Federal Reserve must be secured to the satisfaction of the lending Reserve Bank. Discount window loans are made with recourse to the borrower beyond the pledged collateral. Nonetheless, collateral plays an important role in mitigating the credit risk associated with these extensions of credit. The Federal Reserve generally accepts as collateral for discount window loans any assets that meet regulatory standards for sound asset quality. This category of assets includes most performing loans and most investment-grade securities, although for some types of securities (including commercial MBS, collateralized debt obligations, collateralized loan obligations, and certain non-dollar-denominated foreign securities) only very high-quality securities are accepted. An institution may not pledge as collateral any instruments that the institution or its affiliates have issued.

Assets accepted as collateral are assigned a lendable value deemed appropriate by the Reserve Bank; lendable value is determined as the market price of the asset, less a haircut. Securities are valued using market prices supplied by external vendors. Securities for which a price is not available from the Federal Reserve's pricing vendors receive zero collateral value. Loans pledged as collateral are valued using an internally modeled fair market value estimate. Haircuts reflect credit risk and, for traded assets, the historical volatility of the asset's price and the liquidity of the market in which the asset is traded; the Federal Reserve's haircuts are generally in line with typical market practice.

A borrower may be required to pledge additional collateral if its financial condition weakens. Collateral is pledged by depository institutions under the terms and conditions specified in the Federal Reserve Banks' standard lending agreement, Operating Circular No. 10, available at www.frbservices.org/assets/resources/rules-regulations/071613-operating-circular-10.pdf.

To ensure that they can borrow from the Federal Reserve should the need arise, many depository institutions that do not have an outstanding discount window loan nevertheless routinely pledge collateral. As presented in table 6, depository institutions that borrow from the Federal Reserve generally maintain collateral in excess of their current borrowing levels.

The Federal Reserve periodically reviews its collateral margins and valuation practices. The current lending margins on discount window collateral took effect on August 1, 2018, and reflect the results from the most recent such review, as well as the incorporation of updated market data. Additional information on collateral margins is available on the Discount Window and Payment System Risk public website, www.frbdiscountwindow.org.

Table 6. Discount window credit outstanding to borrowing depository institutions—percent of collateral used
As of October 24, 2018

Percent of collateral used	Number of borrowers	Total borrowing ($ billions)
More than 0 and less than 25	24	*
25 to 50	7	0.1
50 to 75	14	0.1
75 to 90	5	*
More than 90	6	*
Total	**56**	**0.2**

Note: Unaudited. Components may not sum to totals because of rounding.
* Less than $50 million.

Liquidity Arrangements with Foreign Central Banks

Recent Developments

- As presented in table 7, as of October 24, 2018, dollar liquidity extended under the central bank liquidity swap arrangements totaled $0.1 billion. Detailed information about swap operations is available at https://apps.newyorkfed.org/markets/autorates/fxswap.

Background

Because of the global character of bank funding markets, the Federal Reserve has at times coordinated with other central banks to provide liquidity. Starting in December 2007, the Federal Reserve entered into agreements to establish temporary currency arrangements (central bank liquidity swap lines) with several FCBs in order to provide liquidity in U.S. dollars. Later, foreign currency liquidity swap lines were established with a few FCBs. These temporary arrangements expired on February 1, 2010.

In May 2010, temporary U.S. dollar liquidity swap lines were reestablished with the Bank of Canada, the Bank of England, the Bank of Japan, the European Central Bank, and the Swiss National Bank in order to address the reemergence of strains in global U.S. dollar short-term funding markets. The FOMC authorized extensions of these temporary arrange-

Table 7. Amounts outstanding under U.S. dollar liquidity swaps
As of October 24, 2018

Central bank	Total amount outstanding ($ billions)	Individual transaction amount ($ billions)	Settlement date	Term	Interest rate
Bank of Canada	0	0	—	—	—
Bank of England	0	0	—	—	—
Bank of Japan	0	0	—	—	—
European Central Bank	0.1	0.1	10/18/2018	7–day	2.69%
Swiss National Bank	0	0	—	—	—
Total	**0.1**	**0.1**	**—**	**—**	**—**

Note: Unaudited. Components may not sum to totals because of rounding.
* Less than $50 million.

ments in December 2010 and June 2011. On November 30, 2011, as a contingency measure, the FOMC agreed to establish temporary foreign currency liquidity swap arrangements that would allow for the Federal Reserve to access liquidity, if necessary, in any of these FCBs' respective currencies. In December 2012, the FOMC and these five FCBs authorized an extension of the temporary U.S. dollar and foreign currency liquidity swap arrangements through February 1, 2014.

The temporary swap arrangements helped to ease strains in financial markets and mitigate their effects on economic conditions. In October 2013 the Federal Reserve and FCBs announced the conversion of these temporary swap lines to standing arrangements that will remain in place until further notice and will continue to serve as a prudent liquidity backstop. The standing arrangements constitute a network of bilateral swap lines among the six central banks that allow provision of liquidity in each jurisdiction in any of the five currencies foreign to that jurisdiction. Additional information is available at www.federalreserve.gov/newsevents/press/monetary/20131031a.htm.

Since the establishment of the central bank liquidity swap lines in 2007, the Federal Reserve has at times provided U.S. dollar liquidity to FCBs but, except for pre-arranged small-value test operations, has not drawn on any foreign currency liquidity swap lines. The FRBNY operates the swap lines under the authority granted under section 14 of the Federal Reserve Act and in compliance with authorizations, policies, and procedures established by the FOMC. Additional information is available at www.newyorkfed.org/markets/international-market-operations/central-bank-swap-arrangements and www.federalreserve.gov/monetarypolicy/bst_swapfaqs.htm.

U.S. dollar liquidity swaps consist of two transactions. When an FCB draws on its swap line with the FRBNY, the FCB transfers a specified amount of its currency to the FRBNY in exchange for dollars at the prevailing market exchange rate. The FRBNY holds the foreign currency in an account at the FCB. The dollars that the FRBNY provides are then deposited in an account that the FCB maintains at the FRBNY. At the same time, the FRBNY and the FCB enter into a binding agreement for a second transaction that obligates the FCB to return the U.S. dollars and the FRBNY to return the foreign currency on a specified future date at the same exchange rate as the initial transaction. Because the swap transactions will be unwound at the same exchange rate used in the initial transaction, the recorded value of the foreign currency amounts is not affected by changes in the market exchange rate. At the conclusion of the second transaction, the FCB compensates the FRBNY at a market-based interest rate.

When the FCB lends the dollars it obtained by drawing on its swap line to institutions in its jurisdiction, the dollars are transferred from the FCB account at the FRBNY to the account of the bank that the borrowing institution uses to clear its dollar transactions. The FCB is obligated to return the dollars to the FRBNY under the terms of the agreement. Neither the FRBNY nor the Federal Reserve is counterparty to the loan extended by the FCB. The FCB bears the credit risk associated with the loans it makes to institutions in its jurisdiction.

The foreign currency that the Federal Reserve acquires in these transactions is recorded as an asset on the Federal Reserve's balance sheet and is shown in tables 1, 5, and 6 of the weekly H.4.1 statistical release in the line entitled "Central bank liquidity swaps." U.S. dollar liquidity swaps have maturities ranging from overnight to three months. Table 2 of the H.4.1 statistical release reports the maturity distribution of the outstanding U.S. dollar liquidity swaps. Detailed information about drawings on the swap lines by the participating FCBs is presented on the FRBNY's website at https://apps.newyorkfed.org/markets/autorates/fxswap.

Federal Reserve Banks' Financial Information

The Federal Reserve publishes annual audited financial statements and quarterly unaudited financial reports presenting summary information on the combined financial position and results of operations of the Reserve Banks. Annual audited financial statements are available on the Federal Reserve Board's website at www.federalreserve.gov/aboutthefed/audited-annual-financial-statements.htm, and quarterly unaudited financial reports are available at www.federalreserve.gov/aboutthefed/combined-quarterly-financial-reports-unaudited.htm.

Recent Developments

- On November 16, 2018, the Federal Reserve Board published the "Federal Reserve Banks Combined Quarterly Financial Report" for the third quarter of 2018, which includes summary information on the combined financial position and results of operations of the 12 Reserve Banks. All financial information included in the report is unaudited. The report is available on the Federal Reserve Board's website at www.federalreserve.gov/aboutthefed/combined-quarterly-financial-reports-unaudited.htm.
- The average daily balance of the Federal Reserve SOMA holdings was approximately \$4.0 trillion during the first three quarters of 2018. Net earnings from the portfolio were approximately \$81.2 billion (inclusive of \$81.7 billion of net interest income and \$0.5 billion of foreign currency translation losses); most of the earnings were attributable to interest income on Treasury securities and federal agency and GSE MBS.
- After providing for the cost of operations and payment of dividends, the Reserve Banks remitted \$51.6 billion to the Treasury during the first three quarters of 2018.

Appendix

Federal Reserve Disclosure Requirements and Other Provisions of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010

On July 21, 2010, the Dodd-Frank Wall Street Reform and Consumer Protect Act of 2010 (Dodd-Frank Act) was signed into law.[8] The Dodd-Frank Act included legislative changes designed to promote transparency while protecting monetary policy independence and the efficacy of the Federal Reserve's liquidity programs and OMOs. In addition, the Dodd-Frank Act modified the Federal Reserve's authority to provide emergency liquidity to nondepository institutions under section 13(3) of the Federal Reserve Act and also specifically prohibits (with certain exceptions) lending through the discount window to institutions that are registered as swap dealers or major swap participants.

Disclosure Requirements

On December 1, 2010, the Federal Reserve posted to its public website detailed information about entities that received loans or other financial assistance under a section 13(3) credit facility between December 1, 2007, and July 21, 2010, and about persons or entities that participated in the agency MBS purchase program, used foreign currency liquidity swap lines, or borrowed through the Term Auction Facility (TAF) during that time frame. This disclosure, required by the Dodd-Frank Act, included more than 21,000 individual credit and other transactions conducted to stabilize markets during the financial crisis, restore the flow of credit to American families and businesses, and support economic recovery and job creation in the aftermath of the crisis. The Federal Reserve's disclosure about these transactions is available at www.federalreserve.gov/newsevents/reform_transaction.htm.

As required by the Dodd-Frank Act, the Federal Reserve also posted an audit webpage, available at www.federalreserve.gov/newsevents/reform_audit.htm. This page is updated as reports and other information become available.

The Dodd-Frank Act also established a framework for the delayed disclosure of information on entities that, after July 21, 2010, received a loan from the discount window under section 10B of the Federal Reserve Act or from a section 13(3) facility, or participated in OMO transactions. Generally, this framework requires the Federal Reserve to publicly disclose certain information about these discount window borrowers and OMO counterparties approximately two years after the relevant loan or transaction; information about borrowers under future section 13(3) facilities will be disclosed one year after the authorization for the facility is terminated. Information to be disclosed will include the names and identifying details of each borrower or counterparty, the amount borrowed, the interest rate paid, and information identifying the types and amounts of collateral pledged or assets transferred in connection with the borrowing or transaction. The disclosures of discount window borrowers and OMO counterparties commenced in September 2012; the information is available at www.federalreserve.gov/newsevents/reform_quarterly_transaction.htm and www.newyorkfed.org/markets/OMO_transaction_data.html.

Other Provisions

The Dodd-Frank Act modified the Federal Reserve's authority to provide emergency liquidity to nondepository institutions under section 13(3) of the Federal Reserve Act in light of other amendments that provide the U.S. government with new authority to

[8] The full text of the Dodd-Frank Act is available at www.gpo.gov/fdsys/pkg/BILLS-111hr4173enr/pdf/BILLS-111hr4173enr.pdf.

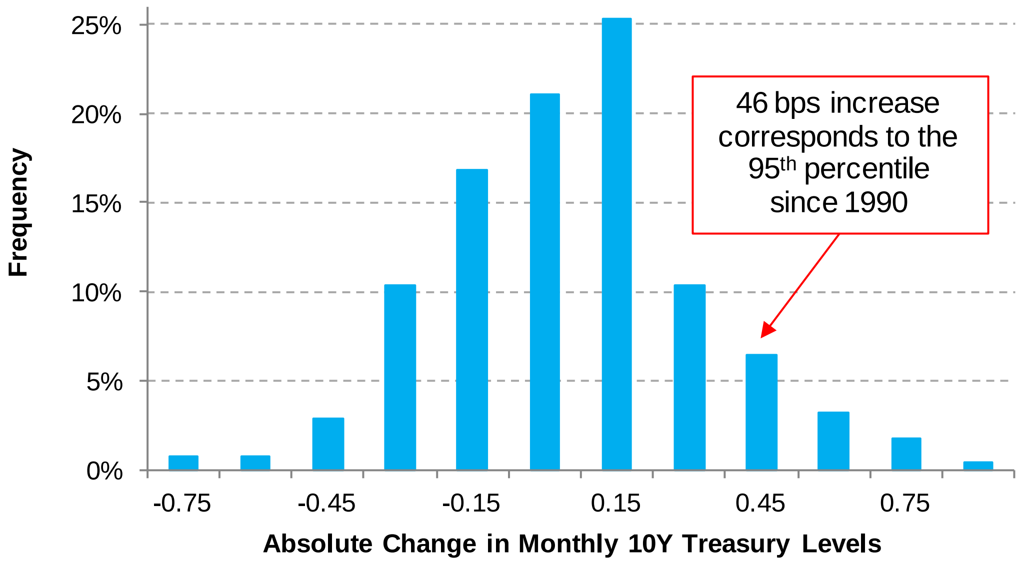
resolve failing, systemically important nonbank financial institutions in an orderly manner. Going forward, any emergency lending programs and facilities authorized by the Federal Reserve under section 13(3) of the Federal Reserve Act must have broad-based eligibility and must be approved by the Secretary of the Treasury, among several other limitations.

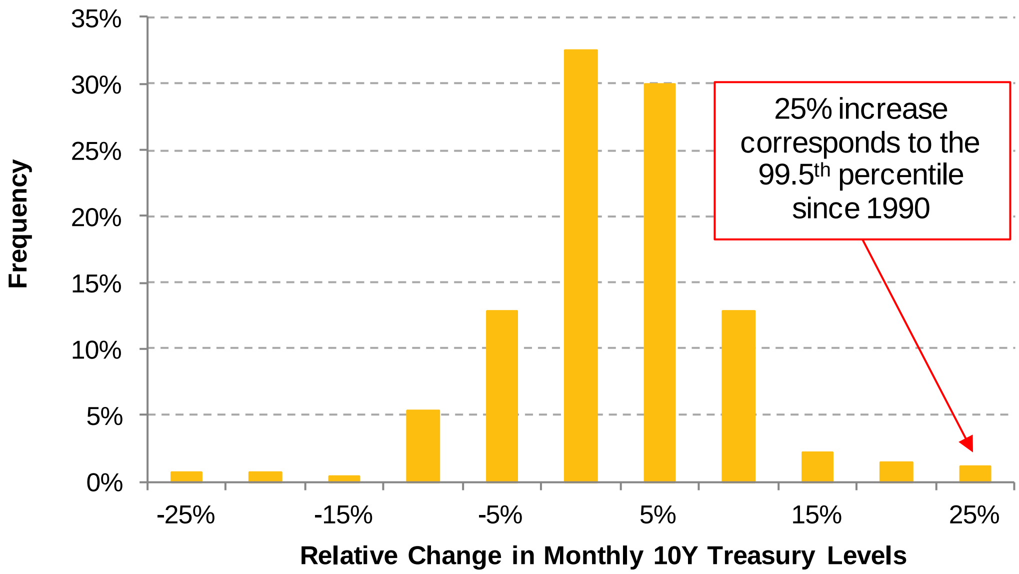
Section 716 of the Dodd-Frank Act prohibits the Federal Reserve from extending discount window credit to "swaps entities," subject to certain exceptions. A swaps entity includes a person that is registered as a swap dealer, security-based swap dealer, major swap participant, or major security-based swap participant under the Commodity Exchange Act or Securities Exchange Act of 1934, other than an insured depository institution that is registered as a major swap participant or major security-based swap participant.[9] The provisions of section 716 became effective on July 16, 2013. Accordingly, in early July 2013 the Federal Reserve amended its Operating Circular No. 10, the standard lending agreement under which institutions borrow from the discount window, in order to comply with the requirements of section 716. Under the amended Operating Circular No. 10, each time that a borrower requests an advance, it must be, and is deemed to represent, that it is not a swaps entity (as defined above), or it is a swaps entity that is eligible to receive the advance pursuant to one or more subsections of section 716 of the Dodd-Frank Act.

[9] In June 2013, the Federal Reserve Board issued an interim final rule to clarify that uninsured U.S. branches and agencies of foreign banks are treated as insured depository institutions for purposes of section 716. The interim final rule also set out the process for state member banks and uninsured state branches and agencies of foreign banks to apply to the Board for the compliance transition period provided for in section 716. See 78 Fed. Reg. 34545 (June 10, 2013).

www.federalreserve.gov

Distribution of Monthly Changes to the 10-Year Treasury Yield
1990-2013





Source: Barclays

MOODY'S
INVESTORS SERVICE

Rating Action: Moody's changes outlooks on 25 US regulated utilities primarily impacted by tax reform

19 Jan 2018

New York, January 19, 2018 -- Moody's Investors Service, ("Moody's") has changed the rating outlooks to negative from stable for 24 regulated utilities and utility holding companies; and to stable from positive for one utility holding company in the United States. The short-term and long-term ratings for all 25 companies were affirmed.

RATINGS RATIONALE

"Today's action primarily applies to companies that already had limited cushion in their rating for deterioration in financial performance, will be incrementally impacted by changes in the tax law and where we now expect key credit metrics to be lower for longer," said Jim Hempstead, a Managing Director at Moody's. "Utilities will work closely with state regulators to try to mitigate the negative impact of tax reform and in some cases they may seek to refine their corporate financial policies. Where successful, their rating outlooks could revert to stable."

Tax reform is credit negative for US regulated utilities because the lower 21% statutory tax rate reduces cash collected from customers, while the loss of bonus depreciation reduces tax deferrals, all else being equal. Moody's calculates that the recent changes in tax laws will dilute a utility's ratio of cash flow before changes in working capital to debt by approximately 150 - 250 basis points on average, depending to some degree on the size of the company's capital expenditure programs. From a leverage perspective, Moody's estimates that debt to total capitalization ratios will increase, based on the lower value of deferred tax liabilities.

The change in outlook to negative from stable for the 24 companies affected in this rating action primarily reflects the incremental cash flow shortfall caused by tax reform on projected financial metrics that were already weak, or were expected to become weak, given the existing rating for those companies. The negative outlook also considers the uncertainty over the timing of any regulatory actions or other changes to corporate finance polices made to offset the financial impact.

The change in outlook to stable from positive for American Electric Power Company, Inc. (AEP, Baa1 stable) reflects Moody's calculations that the projected ratio of cash flow before changes in working capital to debt, incorporating the effects of tax reform, will remain in the mid-teens range. At this level, Moody's believes AEP's Baa1 rating is appropriate.

The vast majority of US regulated utilities, however, continue to maintain stable rating outlooks. We do not expect the cash flow reduction associated with tax reform to materially impact their credit profiles because sufficient cushion exists within projected financial metrics for their current ratings. Nonetheless, further actions could occur on a company specific basis.

Over the next 12 to 18 months, Moody's will continue to monitor the financial impact of tax reform on each company, including its regulatory approach to rate treatment and any changes to corporate finance strategies. This will include balance sheet changes due to the reclassification of excess deferred tax liabilities as a regulatory liability and the magnitude of any amounts to be refunded to customers. If the financial impact of tax reform is more severe than Moody's initial estimates or the companies fail to materially mitigate any weaknesses in their financial profiles, the ratings could be downgraded.

That said, Moody's expects that most utilities will attempt to manage any negative financial implications of tax reform through regulatory channels. Corporate financial policies could also change. The actions taken by utilities will be incorporated into the credit analysis on a prospective basis. As a result, it is conceivable that some companies will sufficiently defend their credit profiles. For these companies, it is possible for the outlook to return to stable.

Potential regulatory offsets to tax-related cash leakage could include: accelerated cost recovery of certain regulatory assets or future investment; changes to the equity layer or allowed ROEs in rates, and other actions. Changes to corporate financial policies could include changes to capitalization, the financing of future investments, dividend growth, or others. Some of these corporate measures could have a more immediate boost to projected metrics than certain regulatory provisions, which may take time to approve and implement.

Outlook Actions:

..Issuer: American Electric Power Company, Inc.

....Outlook, Changed To Stable From Positive

..Issuer: Avista Corp.

....Outlook, Changed To Negative From Stable

..Issuer: Avista Corp. Capital II

....Outlook, Changed To Negative From Stable

..Issuer: Duke Energy Corporation

....Outlook, Changed To Negative From Stable

..Issuer: Entergy Corporation

....Outlook, Changed To Negative From Stable

..Issuer: New Jersey Natural Gas Company

....Outlook, Changed To Negative From Stable

..Issuer: Northwest Natural Gas Company

....Outlook, Changed To Negative From Stable

..Issuer: ONE Gas, Inc

....Outlook, Changed To Negative From Stable

..Issuer: Piedmont Natural Gas Company, Inc.

....Outlook, Changed To Negative From Stable

..Issuer: Public Service Company of Oklahoma

....Outlook, Changed To Negative From Stable

..Issuer: Questar Gas Company

....Outlook, Changed To Negative From Stable

..Issuer: South Jersey Gas Company

....Outlook, Changed To Negative From Stable

..Issuer: Alabama Power Capital Trust V

....Outlook, Changed To Negative From Stable

..Issuer: Alabama Power Company

....Outlook, Changed To Negative From Stable

..Issuer: Southern Company (The)

....Outlook, Changed To Negative From Stable

..Issuer: Southern Elect Generating Co

....Outlook, Changed To Negative From Stable

..Issuer: Southwestern Public Service Company

....Outlook, Changed To Negative From Stable

..Issuer: Wisconsin Gas LLC

....Outlook, Changed To Negative From Stable

..Issuer: American Water Capital Corp.

....Outlook, Changed To Negative From Stable

Issuer: American Water Works Company, Inc.

....Outlook, Changed To Negative From Stable

Outlook Actions:

..Issuer: Consolidated Edison Company of New York, Inc.

....Outlook, Changed To Negative From Stable

..Issuer: Consolidated Edison, Inc.

....Outlook, Changed To Negative From Stable

..Issuer: Orange and Rockland Utilities, Inc.

....Outlook, Changed To Negative From Stable

..Issuer: Brooklyn Union Gas Company, The

....Outlook, Changed To Negative From Stable

..Issuer: KeySpan Gas East Corporation

....Outlook, Changed To Negative From Stable

Affirmations:

..Issuer: American Electric Power Company, Inc.

.... Commercial Paper, Affirmed P-2

....Senior Unsecured Shelf, Affirmed (P)Baa1

....Junior Subordinated Shelf, Affirmed (P)Baa2

....Senior Unsecured Regular Bond/Debenture, Affirmed Baa1

..Issuer: Avista Corp.

.... Issuer Rating, Affirmed Baa1

....Senior Secured First Mortgage Bonds, Affirmed A2

....Underlying Senior Secured First Mortgage Bonds, Affirmed A2

....Senior Secured Medium-Term Note Program, Affirmed (P)A2

....Senior Secured Regular Bond/Debenture, Affirmed A2

....Senior Unsecured Medium-Term Note Program, Affirmed (P)Baa1

..Issuer: Avista Corp. Capital II

....Pref. Stock Preferred Stock, Affirmed Baa2

..Issuer: Duke Energy Corporation

.... Issuer Rating, Affirmed Baa1

....Junior Subordinated Regular Bond/Debenture, Affirmed Baa2

....Senior Unsecured Shelf, Affirmed (P)Baa1

....Senior Unsecured Bank Credit Facility, Affirmed Baa1

....Senior Unsecured Commercial Paper, Affirmed P-2

....Senior Unsecured Regular Bond/Debenture, Affirmed Baa1

..Issuer: Entergy Corporation

.... Issuer Rating, Affirmed Baa2

....Senior Unsecured Commercial Paper, Affirmed P-2

....Senior Unsecured Regular Bond/Debenture, Affirmed Baa2

....Senior Unsecured Shelf, Affirmed (P)Baa2

..Issuer: New Jersey Natural Gas Company

.... Commercial Paper, Affirmed P-1

..Issuer: Northwest Natural Gas Company

.... Commercial Paper, Affirmed P-2

....Senior Secured Medium-Term Note Program, Affirmed (P)A1

....Senior Unsecured Medium-Term Note Program, Affirmed (P)A3

....Senior Secured Shelf, Affirmed (P)A1

....Senior Unsecured Shelf, Affirmed (P)A3

....Preferred Shelf, Affirmed (P)Baa2

....Senior Secured First Mortgage Bonds, Affirmed A1

....Senior Secured Regular Bond/Debenture, Affirmed A1

..Issuer: ONE Gas, Inc

....Senior Unsecured Commercial Paper, Affirmed P-1

....Senior Unsecured Regular Bond/Debenture, Affirmed A2

..Issuer: Piedmont Natural Gas Company, Inc.

....Senior Unsecured Commercial Paper, Affirmed P-1

....Senior Unsecured Regular Bond/Debenture, Affirmed A2

..Issuer: Public Service Company of Oklahoma

.... Issuer Rating, Affirmed A3

....Senior Unsecured Regular Bond/Debenture, Affirmed A3

..Issuer: Questar Gas Company

....Senior Unsecured Commercial Paper, Affirmed P-1

....Senior Unsecured Medium-Term Note Program, Affirmed (P)A2

....Senior Unsecured Regular Bond/Debenture, Affirmed A2

..Issuer: Alabama Power Capital Trust V

....Pref. Stock Preferred Stock, Affirmed A2

..Issuer: Alabama Power Company

.... Commercial Paper, Affirmed P-1

.... Issuer Rating, Affirmed A1

....Senior Unsecured Shelf, Affirmed (P)A1

....Preferred Shelf, Affirmed (P)A3

....Preference Shelf, Affirmed (P)A3

....Pref. Stock Preferred Stock, Affirmed A3

....Senior Unsecured Bank Credit Facility, Affirmed A1

....Senior Unsecured Commercial Paper, Affirmed P-1

....Senior Unsecured Regular Bond/Debenture, Affirmed A1

..Issuer: Columbia (Town of) AL, Industrial Dev. Board

....Senior Unsecured Revenue Bonds, Affirmed A1

....Senior Unsecured Revenue Bonds, Affirmed VMIG 1

..Issuer: Eutaw (City of) AL, Industrial Dev. Board

....Senior Unsecured Revenue Bonds, Affirmed A1

....Senior Unsecured Revenue Bonds, Affirmed VMIG 1

..Issuer: Mobile (City of) AL, I.D.B.

....Senior Unsecured Revenue Bonds, Affirmed A1

....Senior Unsecured Revenue Bonds, Affirmed VMIG 1

..Issuer: Walker County Econ & Ind Dev Authority

....Senior Unsecured Revenue Bonds, Affirmed A1

....Senior Unsecured Revenue Bonds, Affirmed VMIG 1

..Issuer: West Jefferson (Town of) AL, Ind. Devel. Bd.

....Senior Unsecured Revenue Bonds, Affirmed A1

....Senior Unsecured Revenue Bonds, Affirmed VMIG 1

..Issuer: Wilsonville (Town of) AL, I.D.B.

....Senior Unsecured Revenue Bonds, Affirmed A1

....Senior Unsecured Revenue Bonds, Affirmed VMIG 1

....Underlying Senior Unsecured Revenue Bonds, Affirmed A1

..Issuer: South Jersey Gas Company

.... Issuer Rating, Affirmed A2

....Senior Secured First Mortgage Bonds, Affirmed Aa3

....Senior Secured Medium-Term Note Program, Affirmed (P)Aa3

....Senior Secured Regular Bond/Debenture, Affirmed Aa3

....Senior Unsecured Commercial Paper, Affirmed P-1

..Issuer: New Jersey Economic Development Authority

....Senior Secured Revenue Bonds, Affirmed Aa3

....Underlying Senior Secured Revenue Bonds, Affirmed Aa3

....Senior Secured Revenue Bonds, Affirmed Aa2

....Underlying Senior Secured Revenue Bonds, Affirmed Aa2

..Issuer: Southern Company (The)

.... Commercial Paper, Affirmed P-2

....Junior Subordinated Regular Bond/Debenture, Affirmed Baa3

....Senior Unsecured Shelf, Affirmed (P)Baa2

....Junior Subordinated Shelf, Affirmed (P)Baa3

....Senior Unsecured Bank Credit Facility, Affirmed Baa2

....Senior Unsecured Regular Bond/Debenture, Affirmed Baa2

..Issuer: Southern Elect Generating Co

.... Issuer Rating, Affirmed A2

....Senior Unsecured Regular Bond/Debenture, Affirmed A1

..Issuer: Southwestern Public Service Company

.... Issuer Rating, Affirmed Baa1

....Senior Secured Shelf, Affirmed (P)A2

....Senior Unsecured Shelf, Affirmed (P)Baa1

....Senior Secured First Mortgage Bonds, Affirmed A2

....Senior Unsecured Bank Credit Facility, Affirmed Baa1

....Senior Unsecured Commercial Paper, Affirmed P-2

....Senior Unsecured Regular Bond/Debenture, Affirmed Baa1

..Issuer: Wisconsin Gas LLC

.... Commercial Paper, Affirmed P-1

....Senior Unsecured Regular Bond/Debenture, Affirmed A2

..Issuer: American Water Capital Corp.

.... Issuer Rating, Affirmed A3

....Senior Unsecured Shelf, Affirmed (P)A3

....Senior Unsecured Commercial Paper, Affirmed P-2

....Senior Unsecured Regular Bond/Debenture, Affirmed A3

..Issuer: American Water Works Company, Inc.

.... Issuer Rating, Affirmed A3

..Issuer: Berks County Industrial Development Auth., PA

....Senior Unsecured Revenue Bonds, Affirmed A3

..Issuer: California Pollution Control Financing Auth.

....Senior Unsecured Revenue Bonds, Affirmed A3

..Issuer: Illinois Development Finance Authority

....Senior Unsecured Revenue Bonds, Affirmed A3

..Issuer: Illinois Finance Authority

....Senior Unsecured Revenue Bonds, Affirmed A3

..Issuer: Indiana Finance Authority

....Senior Unsecured Revenue Bonds, Affirmed A3

..Issuer: MARICOPA COUNTY INDUSTRIAL DEVELOPMENT AUTHORITY,AZ

....Senior Unsecured Revenue Bonds, Affirmed A3

..Issuer: Northampton County I.D.A., PA

....Senior Unsecured Revenue Bonds, Affirmed A3

..Issuer: Owen (County of) KY

....Senior Unsecured Revenue Bonds, Affirmed A3

.Issuer: Consolidated Edison Company of New York, Inc.

.... Issuer Rating, Affirmed A2

....Senior Unsecured Shelf, Affirmed (P)A2

....Subordinate Shelf, Affirmed (P)A3

....Preferred Shelf, Affirmed (P)Baa1

....Senior Unsecured Commercial Paper, Affirmed P-1

....Senior Unsecured Regular Bond/Debenture, Affirmed A2

....Underlying Senior Unsecured Regular Bond/Debenture, Affirmed A2

..Issuer: New York State Energy Research & Dev. Auth.

....Senior Unsecured Revenue Bonds, Affirmed A2

....Underlying Senior Unsecured Revenue Bonds, Affirmed A2

..Issuer: New York State Research & Development Auth.

....Senior Unsecured Revenue Bonds, Affirmed A2

....Underlying Senior Unsecured Revenue Bonds, Affirmed A2

..Issuer: Consolidated Edison, Inc.

.... Issuer Rating, Affirmed A3

....Senior Unsecured Shelf, Affirmed (P)A3

....Senior Unsecured Commercial Paper, Affirmed P-2

....Senior Unsecured Regular Bond/Debenture, Affirmed A3

..Issuer: Orange and Rockland Utilities, Inc.

.... Issuer Rating, Affirmed A3

....Senior Unsecured Commercial Paper, Affirmed P-2

....Senior Unsecured Regular Bond/Debenture, Affirmed A3

..Issuer: Brooklyn Union Gas Company, The

....LT Issuer Rating, Affirmed A2

....Senior Unsecured Regular Bond/Debenture, Affirmed A2

..Issuer: New York State Energy Research & Dev. Auth.

....Backed LT IRB/PC Insured, Affirmed A2

...Underlying LT IRB/PC, Affirmed A2

Issuer: KeySpan Gas East Corporation

....LT Issuer Rating, Affirmed A2

....Senior Unsecured Regular Bond/Debenture, Affirmed A2

The principal methodology used in rating Public Service Company of Oklahoma, Southwestern Public Service Company, Southern Company (The), Alabama Power Company, Alabama Power Capital Trust V, Southern Elect Generating Co, South Jersey Gas Company, Wisconsin Gas LLC, American Electric Power Company, Inc., Duke Energy Corporation, Piedmont Natural Gas Company, Inc., Avista Corp., Avista Corp. Capital II, ONE Gas, Inc, New Jersey Natural Gas Company, Northwest Natural Gas Company, Questar Gas Company, Entergy Corporation, Consolidated Edison, Inc., Consolidated Edison Company of New York, Inc., Brooklyn Union Gas Company, The, KeySpan Gas East Corporation, and Orange and Rockland Utilities, Inc. was Regulated Electric and Gas Utilities published in June 2017. The principal methodology used in rating American Water Works Company, Inc. and American Water Capital Corp. was Regulated Water Utilities published in December 2015. Please see the Rating Methodologies page on www.moodys.com for a copy of these methodologies.

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CREDIT OPINION
31 January 2018

Update

Rate this Research

RATINGS

Consolidated Edison Company of New York, Inc.

Domicile	New York, New York, United States
Long Term Rating	A2
Type	LT Issuer Rating
Outlook	Negative

Please see the ratings section at the end of this report for more information. The ratings and outlook shown reflect information as of the publication date.

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Consolidated Edison Company of New York, Inc.

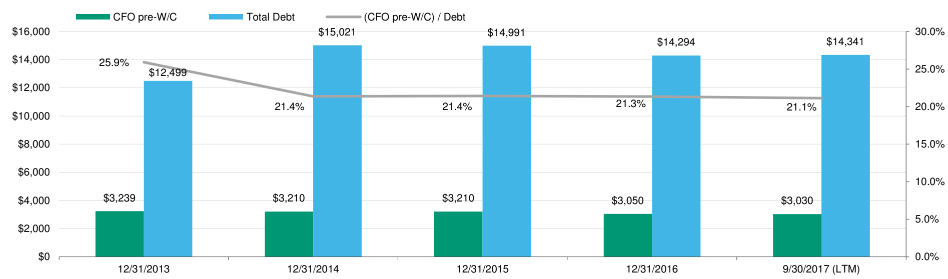
Update following negative outlook

Summary

Consolidated Edison Company of New York, Inc's (CECONY, A2 Negative) credit profile is supported by its low business risk, supportive regulatory environment and consistent financial metrics. The company is now operating under a three year rate plan which provides visibility and predictability into its future cash flows.

However, CECONY's credit profile is constrained by rising capex requirements, a high dividend payout, and negative cash implications as a result of Federal tax reform. These factors could pressure the company's financial position and credit profile going forward. Longer term, the company must contend with the operational demands that accompany changing customer preferences.

Exhibit 1
Historical CFO Pre-WC, Total Debt and CFO Pre-WC to Debt



Source: Moody's Investors Service

Credit strengths

» Low business risk transmission and distribution utility serving the largest city in the US

» New York regulation provides a suite of supportive cost recovery mechanisms

» Stable and predictable cash flow production

Credit challenges

» Cash impact of tax reform could weaken financial profile versus peers

» High capex requirements and high dividend payout

» State's move toward more renewable energy creates new operating demands

Rating outlook

CECONY's negative outlook is driven by the negative impact from Federal tax reform, signed into law in December 2017. The resulting deterioration in cash flow, due to the early termination of bonus depreciation among other cash negative provisions, will pressure already weaker financial metrics compared to peers. We see potential for the company to generate CFO pre-WC to debt in the high-teens range on a sustained basis.

However, we expect CECONY to maintain a constructive regulatory relationship with the New York State Public Service Commission (NYPSC) while they actively investigate methods in how to approach tax reform.

CECONY's outlook could return to stable if the company is able to mitigate the negative cash flow impact from tax reform through regulatory developments to offset cash flow leakage with some other cash generative measures.

Factors that could lead to an upgrade

» Cash flow to debt ratios above 25% for a sustained period.

» CFO pre-WC less dividends to debt nearing 20%.

Factors that could lead to a downgrade

» Cash flow to debt falls below 20% for a sustained period.

» A less predictable regulatory environment or reduced cost recovery provisions.

» Significant increase to holding company debt level or risk profile that pressures CECONY for dividends.

Key indicators

Exhibit 2

KEY INDICATORS [1]

Consolidated Edison Company of New York, Inc.

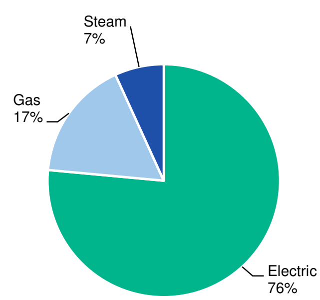
	12/31/2013	12/31/2014	12/31/2015	12/31/2016	9/30/2017(L)
CFO pre-WC + Interest / Interest	6.0x	6.3x	5.6x	5.5x	5.6x
CFO pre-WC / Debt	25.9%	21.4%	21.4%	21.3%	21.1%
CFO pre-WC – Dividends / Debt	20.1%	16.6%	15.6%	16.1%	15.7%
Debt / Capitalization	40.1%	43.8%	42.8%	40.3%	39.1%

[1]All ratios are based on 'Adjusted' financial data and incorporate Moody's Global Standard Adjustments for Non-Financial Corporations.
Source: Moody's Investors Service

Profile

Consolidated Edison Company of New York, Inc. (CECONY, A2 negative) is the anchor subsidiary of Consolidated Edison, Inc. (CEI, A3 negative), which also owns Orange and Rockland Utilities, Inc. (O&R, A3 negative). CECONY is the largest US transmission and distribution (T&D) utility, serving 3.4 million electric, 1.1 million gas, and 1,600 steam customers in New York City and Westchester County. CECONY's electric operations account for about 80% of the company's operating income, gas represents another 15% of operating income, while steam makes up the remaining 5%. The exhibit below depicts our forward view of EBITDA contribution of each of these segments, based on current rate plans.

Exhibit 3
Electric operations drive the majority of CECONY's EBITDA generation.



Source: Moody's Investors Service

Detailed credit considerations

Federal tax reform expected to negatively impact credit metrics, pending mitigation

The wide-ranging tax legislation that the US Congress passed on December 20th cut the statutory corporate tax rate to 21% from 35%. We view this legislation to be negative for investor-owned utilities, due to the cash leakage that results from some of its stipulations.

Deferred taxes have represented nearly 20% of CECONY's cash flow from operations over the past three years; therefore, the tax rate reduction to 21% will reduce this deferred tax benefit and CECONY's cash flow generation over the next several years. While the utility is expected to maintain relatively stable financial metrics, such as CFO to debt around 20%, in the remaining two years of its current rate plan, we see impact of tax reform as having negative cash flow implications over the long-term, all else being equal.

When normalizing CECONY's cash flow for new tax law, we see the potential for the company to generate cash flow to debt metrics in the high-teen's range. This reflects a 21% tax rate, reduced revenue requirement, low cash tax payments and normalized refunds of excess deferred tax liabilities to customers. Since utilities were carved out of the tax law that allowed for a full expensing of capital investment, we also believe that CECONY will pay higher cash taxes in the coming years. This could keep cash flow to debt metrics in the high teens for a sustained period of time.

NYPSC decisions will be key to the actual impact of tax reform

The NYPSC will be instrumental in how Federal tax reform ultimately impacts the credit profile of CECONY. That is because we see uncertainty around the specific amount and pace of any "unprotected" deferred tax liability refunds that CECONY may be required to pay, the nature and timing of customer benefits and any potential to offset cash flow leakage with some other cash generative measure. The NYPSC is actively investigating methods in how to approach tax reform and we expect increasing clarity in the coming months.

In Niagara Mohawk Power Corporation's (NiMo, A2 stable) January 2018 rate order, the commission did offer some initial guidance on how the rate process for tax reform could work. In a brief section of the order, the commission mentioned the following key points: current rates for NiMo would reflect the 21% Federal tax rate; a state-wide compliance filing on new tax law should be made by year-end; the benefits of tax reform should accrue to customers; deferral accounts could be used to track rate impacts; and that the NYPSC could choose to address the topic in a generic rate proceeding that could result in changes to ratemaking.

Weak cash flow metrics compared to peers

Historically, CECONY has produced very stable cash flow metrics, consistently at 21% CFO pre-WC to debt. This stability has offset a somewhat weaker financial profile compared to peers with similar credit worthiness. A few examples of A2-rated T&D companies include Public Service Electric and Gas Company, PECO Energy and NiMo. Over the last 2 years, these utilities have produced an average CFO pre-WC to debt of around 24%, higher than CECONY's 21% for the same period.

Exhibit 4

Peer Comparison [1]

CECONY's cash flow metrics are steadily lower than A2 rated peers

	Consolidated Edison Company of New York, Inc.			Public Service Electric and Gas Company			PECO Energy Company			Niagara Mohawk Power Corporation		
	A2, Negative			A2, Stable			A2, Stable			A2, Stable		
($ in US millions)	FYE Dec 2015	FYE Dec 2016	LTM Sept 2017	FYE Dec 2015	FYE Dec 2016	LTM Sept 2017	FYE Dec 2015	FYE Dec 2016	LTM Sept 2017	FYE Mar 2015	FYE Mar 2016	LTM Mar 2017
Revenue	$ 10,328	$ 10,165	$ 10,372	$ 6,636	$ 6,221	$ 6,164	$ 3,032	$ 2,994	$ 2,842	$ 3,168	$ 2,858	$ 2,849
EBITDA	$ 3,730	$ 3,608	$ 3,742	$ 2,403	$ 2,231	$ 2,426	$ 927	$ 999	$ 948	$ 372	$ 444	$ 458
(CFO Pre-WC + Interest) / Interest	5.6x	5.5x	5.6x	6.4x	5.7x	5.9x	7.4x	7.4x	7.3x	5.9x	5.8x	5.9x
CFO Pre-W/C / Debt	21%	21%	21%	26%	21%	21%	25%	28%	25%	18%	21%	23%
(CFO Pre-W/C - Dividends) / Debt	16%	16%	16%	26%	21%	21%	16%	18%	16%	18%	21%	23%
Debt / Book Capitalization	43%	40%	39%	36%	36%	35%	33%	31%	33%	34%	32%	31%
Debt / EBITDA	4.0x	4.0x	3.8x	3.0x	3.7x	3.5x	3.3x	2.9x	3.4x	5.3x	4.3x	4.2x

[1] All figures & ratios calculated using Moody's estimates & standard adjustments.
Source: Moody's Investors Service

Without considering other factors such as predictability, size, and diversity of customers, CECONY's cash flow metrics would indicate that its credit profile should be in line with a T&D utility such as Commonwealth Edison Company (A3 stable), which produced CFO pre-WC to debt of 22% through LTM 3Q17. CECONY's financial position is offset by its strong qualitative benefits as a result of its size and market position.

High capital expenditures and dividends limit financial upside

CECONY expects to spend nearly $3.0 billion in annual capital expenditures through 2019, for general improvements in their electric, gas and steam infrastructure, including investments in supporting the REV initiative. This level of cash outlay, coupled with high dividend payout levels (e.g., 73% through LTM 3Q17) will likely pressure financial metrics downward, given debt funding of negative free cash flow.

Regulatory environment provides strong support for timely cost recovery

CECONY's credit is based on its low business risk as a T&D utility and the stabilizing features of the regulatory support provided by its principal regulator, the New York State Public Service Commission (NYPSC). The New York regulatory framework has a number of credit-positive features, including the allowance of a future test year in calculating revenue requirements, multi-year rate plans and the use of full revenue decoupling for both electric and gas services (and weather normalization for gas). These features enhance the timeliness of cost recovery, provide visibility into future financial performance and protect utility margins from variations in sales volumes.

On 24 January 2017, the NYPSC approved CECONY's three year electric and gas rate plans, which went into effect in January 2017. Under the plan, CECONY is authorized three levelized electric base rate increases of $199 million in 2017, 2018 and 2019, based on a 9% allowed return on equity (ROE) and a 48% equity layer in the capital structure. Additionally, the approved plan authorizes a three-step gas base rate increase, which collectively will add about $218 million to the gas revenue requirement over the three year period.

Beyond the financial implications of the approved plan, the multi-party filing is a significant positive because it offers clear evidence of cooperation between CECONY, the NYPSC staff, and key customers. This collaborative relationship is essential for CECONY to maintain a stable and predictable financial profile, especially as various energy initiatives throughout the state develop.

Long-term operational changes to accommodate changing customer and regulatory preferences

Under the State of New York's Reforming the Energy Vision Initiative (REV, a proceeding that began in 2014 to promote clean energy, energy efficiency, and distributed generation throughout the state), CECONY will be required to adapt planning and operations to accommodate changing customer and regulatory demands for clean and efficient energy delivery. Rather than relying solely on the traditional utility-lead resource procurement and infrastructure rate base build, CECONY will have to be increasingly responsive to customer supply preferences (e.g., infrastructure that supports distributed and renewable generation), incorporate complex benefit/cost analysis to investment approval processes, and adopt new rate design features that compensate the utility in new ways.

While the exact form of implementation is still evolving, it appears that the foundational policy framework for expense recovery and regulated returns has largely been preserved - a credit positive. So far, the REV process has been benign to credit and we view the NYPSC's proactive and inclusive approach to policy reforms as positive. However, it would be negative to CECONY's credit if the evolution of REV results in a preponderance of market-oriented revenue that drifts from the cost recovery provisions currently underpinning the utility's credit profile.

Liquidity analysis

CECONY's high capex of around $3.0 billion and dividends assumed to be in the $750 - $850 million range will exceed cash flow from operations of approximately $3.0 billion over the next twelve months. Therefore, CECONY will rely on external liquidity resources for short-term needs which will bridge the company to longer-term financing in the capital markets.

In terms of external liquidity, CECONY, affiliate O&R, and CEI are co-borrowers under a credit facility with $2.25 billion committed through December 2022. CECONY is entitled to access the full $2.25 billion, while CEI and O&R are limited to $1.0 billion and $200 million, respectively. The credit facility provides a backstop to the CP programs at each of CEI, CECONY, and O&R which are sized to their respective sub-limits under the revolver. As of 30 September 2017, CEI holding company had around $356 million and CECONY had $147 million of commercial paper outstanding, leaving about $1.75 billion available under its credit facility.

This credit agreement does not require the companies to represent and warrant as to material adverse change, litigation or full disclosure that would restrict access to the facility. It contains a single financial covenant which limits each borrower's Debt/Capitalization to 65%, which CECONY was in compliance with at 30 September 2017.

CECONY's next long-term debt maturities include $600 million due in April 2018 and $600 million due in December 2018. In addition, the company is the obligor for $450 million of variable-rate demand facilities revenue bonds issued by the New York State Energy Research and Development Authority. Each of these demand obligations is supported by its own letter of credit in case the bondholder opts to put it back to CECONY.

Rating methodology and scorecard factors

Exhibit 5

Rating Factors				
Consolidated Edison Company of New York, Inc.				
Regulated Electric and Gas Utilities Industry Grid [1][2]	**Current LTM 9/30/2017**		**Moody's 12-18 Month Forward View As of Date Published [3]**	
Factor 1 : Regulatory Framework (25%)	**Measure**	**Score**	**Measure**	**Score**
a) Legislative and Judicial Underpinnings of the Regulatory Framework	A	A	A	A
b) Consistency and Predictability of Regulation	A	A	A	A
Factor 2 : Ability to Recover Costs and Earn Returns (25%)				
a) Timeliness of Recovery of Operating and Capital Costs	Aa	Aa	Aa	Aa
b) Sufficiency of Rates and Returns	Baa	Baa	Baa	Baa
Factor 3 : Diversification (10%)				
a) Market Position	Aa	Aa	Aa	Aa
b) Generation and Fuel Diversity	N/A	N/A	N/A	N/A
Factor 4 : Financial Strength (40%)				
a) CFO pre-WC + Interest / Interest (3 Year Avg)	5.7x	A	5x - 5.5x	A
b) CFO pre-WC / Debt (3 Year Avg)	21.7%	A	18% - 21%	A
c) CFO pre-WC – Dividends / Debt (3 Year Avg)	16.3%	A	13% - 16%	Baa
d) Debt / Capitalization (3 Year Avg)	40.9%	A	40% - 44%	A
Rating:				
Grid-Indicated Rating Before Notching Adjustment		A2		A2
HoldCo Structural Subordination Notching	0	0	0	0
a) Indicated Rating from Grid		A2		A2
b) Actual Rating Assigned		A2		A2

[1]All ratios are based on 'Adjusted' financial data and incorporate Moody's Global Standard Adjustments for Non-Financial Corporations.
[2]As of 9/30/2017(L);
[3]This represents Moody's forward view; not the view of the issuer; and unless noted in the text, does not incorporate significant acquisitions and divestitures.
Source: Moody's Investors Service

Appendix

Exhibit 6

Cash Flow and Credit Metrics [1]

CF Metrics	2012	2013	2014	2015	2016	LTM (09/17)
As Adjusted						
EBITDA	**3551**	**3638**	**3489**	**3730**	**3608**	**3742**
FFO	**2,369**	**2,158**	**2,458**	**2,479**	**2,449**	**2,577**
- Div	685	728	712	872	744	783
RCF	**1,684**	**1,430**	**1,746**	**1,607**	**1,705**	**1,794**
FFO	**2,369**	**2,158**	**2,458**	**2,479**	**2,449**	**2,577**
+/- ΔWC	52	16	(446)	38	207	-
+/- Other	473	1,081	752	731	601	453
CFO	**2,894**	**3,255**	**2,764**	**3,248**	**3,257**	**3,030**
- Div	685	728	712	872	744	783
- Capex	1,997	2,459	2,314	2,633	2,883	3,004
FCF	**212**	**68**	**(262)**	**(257)**	**(370)**	**(757)**
Debt / EBITDA	4.0x	3.4x	4.3x	4.0x	4.0x	3.8x
EBITDA / Interest	5.1x	5.6x	5.8x	5.4x	5.4x	5.6x
FFO / Debt	16.5%	17.3%	16.4%	16.5%	17.1%	18.0%
RCF / Debt	11.7%	11.4%	11.6%	10.7%	11.9%	12.5%

[1] All figures & ratios calculated using Moody's estimates & standard adjustments.
Source: Moody's Investors Service

Ratings

Exhibit 7

Category	Moody's Rating
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.	
Outlook	Negative
Issuer Rating	A2
Senior Unsecured	A2
Subordinate Shelf	(P)A3
Pref. Shelf	(P)Baa1
Commercial Paper	P-1
PARENT: CONSOLIDATED EDISON, INC.	
Outlook	Negative
Issuer Rating	A3
Senior Unsecured	A3
Commercial Paper	P-2

Source: Moody's Investors Service

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OUTLOOK
8 November 2018

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Regulated utilities - US

2019 outlook negative amid growing debt and stagnant cash flow

The outlook for the US regulated utility sector remains negative because of increasing debt to fund capital spending and dividends, as well as stalled cash flow growth as utilities continue to sort out the implementation of tax reform with state regulators. The combination of these factors means the ratio of funds from operations (FFO) to debt will remain weak. This report updates the more detailed industry outlook published in June 2018.

» **Rising debt and stagnant cash flow mean financial ratios will remain weak.** The negative cash flow ramifications of the 2017 Tax Cuts & Jobs Act (TCJA) are beginning to surface in financial statements and will become more evident in results for the second half of 2018. Meanwhile, most capital spending and dividend plans in the sector continue unabated, also contributing to higher funding needs that will be primarily met by debt issuance over the next 12 months. These trends will keep the sector's ratio of consolidated FFO to debt down around 15% in 2019.

» **Some, but not all, regulatory decisions and company policies support metrics.** Some regulatory decisions have provided help to offset cash flow headwinds, and some management teams are improving their balance sheets, including the planned issuance of around $24 billion of equity across the sector announced in 2018. While such efforts will ease the deterioration in key financial ratios, sector-wide financial metrics may not improve before 2020.

» **Carbon transition entails moderate risk, but is also an investment opportunity.** Regulated utilities face only moderate risks from the transition to lower carbon use because they have experience in managing increasingly stringent environmental regulations and have a strong ability to recover the related costs thanks to regulatory provisions. Carbon transition also provides investment opportunities and rate base growth. However, raising utility rates to meet environmental requirements can be politically difficult.

» **What could change our outlook** The outlook could return to stable if we expect the sector's FFO to debt ratio to stop falling, even if that is at lower than historical levels of around 15%-16%. We could consider a positive outlook if we expect a recovery in key cash flow metrics with consolidated FFO to debt returning to the 17%-19% range.

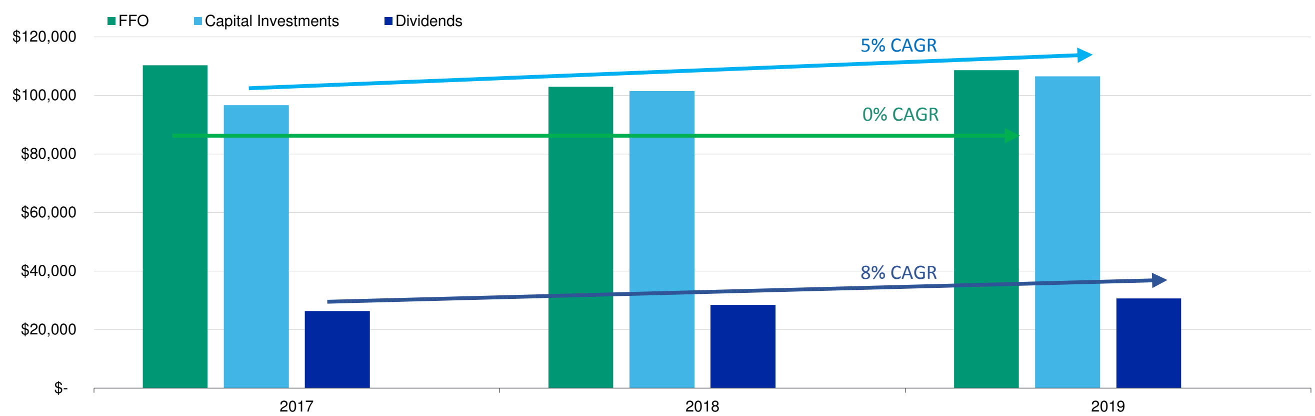
Because outlooks represent our forward-looking view on business conditions that factor into our ratings, a negative (positive) outlook suggests that negative (positive) rating actions are more likely on average. However, the industry outlook does not represent a sum of upgrades, downgrades or ratings under review, or an average of the rating outlooks of issuers in the industry, but rather our assessment of the main direction of business fundamentals within the overall industry.

Rising debt and stagnant cash flow mean financial ratios will continue to decline

The combination of a loss of bonus depreciation and a lower tax rate as a result of the Tax Cuts & Jobs Act (TCJA) means that utilities and their holding companies are losing some of the cash flow contribution that resulted from deferred taxes. For most companies, the effect of lower revenue will become more evident in financial results for the second half of 2018, while most customer refunds by utilities for over-collections related to deferred taxes will occur in 2019 and beyond, also reducing cash flow.

At the same time, industry leverage will remain elevated because most management teams have largely reaffirmed targets for capital spending and dividend growth. This will increase debt at a higher rate than cash flow growth through 2019, since companies will mostly use debt to fund free cash flow deficits. Exhibit 1 compares the growth rates of free cash flow components through 2019.

Exhibit 1
Cash flow growth will lag behind that of capital spending and dividends through 2019
Comparison of compound annual growth rate (CAGR) for FFO, capital investments and dividends

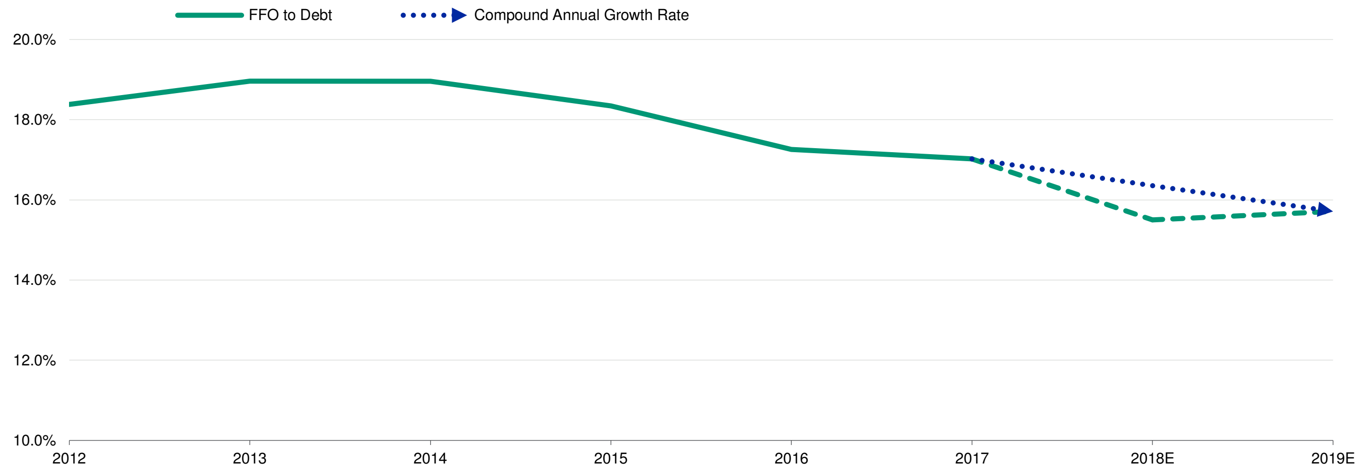


Key assumptions include: capital spending continues to increase by 5.0% per year, down from historical averages; dividends are paid to maintain a 65% payout ratio; and regulators provide cash flow offsets to match customer tax refunds in 2019.
Source: Moody's Investors Service

The combination of rising debt and stagnant cash flow will continue to keep FFO to debt down around 15% in 2019, as shown in Exhibit 2.

Exhibit 2

Stagnant cash flow and rising debt will cause the ratio of FFO to debt to remain weak through 2019



Source: Moody's Investors Service projections

Some, but not all, regulatory decisions and management financial policies provide cash flow support

Some regulatory decisions in 2018 will allow for incremental cash flow generation, such as increased equity capitalization allowed in Alabama, Georgia and Texas, while several others have allowed utilities to offset liabilities due to required customer rebates against assets to be collected in the future. These regulatory decisions should lend some stability to utility cash flows and the financial metrics of affected companies.

On the other hand, some regulatory decisions offer no new cash flow offsets, or not enough to support utility financial metrics at historical levels. For example, a more straightforward application of the new tax law has resulted in the nullification of entire rate increases for Consolidated Edison Company of New York (A3 stable) and Oklahoma Gas & Electric Company (OG&E A3 negative), while up-front customer refunds by Northern States Power - Minnesota (A3 stable) were not offset by another measure to increase cash flow.

Some holding companies have taken defensive measures to support their balance sheets and credit profiles, but other management teams have not taken action to change negative credit momentum. Exhibit 3 shows some holding companies' planned responses to deal with heightened financial risks or other negative credit conditions.

Exhibit 3

Management teams are pursuing different avenues to relieve financial and credit risk
Holding companies with a negative outlook and under review for downgrade (RUR-D) as of 5 November

Company	Rating	Outlook	Pursuing Regulatory Relief for Tax Reform	Incremental Equity Issuance	Selling Assets	Incremental Capex Reduction	% of Annual Capex Reduced	Dividend Reduction
ONE Gas, Inc	A2	Negative	Yes	No	No	No	NA	No
Vectren Utility Holdings, Inc.	A2	Negative	Yes	No	No	No	NA	No
ALLETE, Inc.	A3	Negative	Yes	No	No	No	NA	No
Xcel Energy Inc.	A3	Negative	Yes	Yes	No	No	NA	No
Alliant Energy Corporation	Baa1	Negative	Yes	No	No	No	NA	No
CenterPoint Energy, Inc.	Baa1	Negative	Yes	Yes	No	No	NA	No
OGE Energy Corp.	Baa1	Negative	Yes	No	No	No	NA	No
Sempra Energy	Baa1	Negative	Yes	Yes	Yes	No	NA	No
WGL Holdings, Inc.	Baa1	Negative	Yes	No	No	No	NA	No
Dominion Energy, Inc.	Baa2	Negative	Yes	Yes	Yes	Yes	11%	No
Entergy Corporation	Baa2	Negative	Yes	Yes	No	No	NA	No
PG&E Corporation	Baa2	Negative	Yes	No	No	No	NA	Yes
Cleco Corporate Holdings LLC	Baa3	RUR-D	Yes	No	No	No	NA	No
SCANA Corporation	Ba1	Negative	Yes	No	No	No	NA	Yes

Source: Company announcements and Moody's Investors Service

Some of the more meaningful financial policy changes have included sizeable equity issuance commitments from companies including Duke Energy Inc. (Baa1 stable) and Entergy Corp. (Baa2 negative). Other companies have issued equity and are selling assets to further reduce debt, such as The Southern Company (Baa2 stable), Dominion Energy, Inc. (Baa2 negative) and Sempra Energy (Baa1 negative).

While such efforts will ease the deterioration in key financial ratios, it could be more than 12 months before sector-wide financial metrics improve, because of continued capital spending plans and increasing dividends.

Carbon transition provides moderate risk and investment opportunity

Regulated utilities generally have extensive experience handling increasingly stringent environmental regulations and posses a strong ability to recover the related costs under well-defined regulatory frameworks and oversight.

The requirements involved in transitioning the industry's existing asset base to a lower carbon footprint provide utilities with ample opportunity to add value to rate base by replacing old, depreciated infrastructure. Such investments are typically welcomed by regulatory commissions and local politicians, which then provide the utilities with credit-supportive cost recovery. The increased investment also bolsters earnings growth, which is attractive to equity investors.

However, raising utility rates to mitigate environmental risks or meet air pollution standards can be politically sensitive. Furthermore, increases could encourage distributed generation, such as rooftop solar, because higher utility rates would make alternative sources more cost competitive. New investment could also reduce sales volumes because of the energy efficiencies provided by newer technology. Such developments could lead to a shift in market fundamentals, creating additional risks for regulated utilities, especially those dependent on volume-based charges to cover fixed expenses.

What could change our outlook

The outlook could return to stable if we expect the sector's FFO to debt ratio to stabilize, even if that is at relatively lower levels of around 16%. This could happen in 2019 following the significant equity issuances in 2018 and if financial policies change to include a greater mix of equity funding of free cash flow deficits.

A positive outlook could be considered if we expect a recovery in key cash flow metrics where consolidated cash flow improves the ratio of consolidated FFO to debt, indicating a return to the 17%-19% range.

Moody's related publications

» 2019 outlook shifts to negative due to weaker cash flows, continued high leverage June 2018

» Tax Reform is Credit Negative for Regulated Utilities Sector, but Impact Varies by Company January 2018

» Renewable generation transition unlikely to create significant stranded asset risk November 2018

» Coal, nuclear plant closures continue CO2 decline but power market impact muted June 2018

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Regulated utilities - US

2019 outlook shifts to negative due to weaker cash flows, continued high leverage

Our negative outlook indicates our expectations for the fundamental business conditions driving the US regulated utility industry over the next 12-18 months.

The outlook for the US regulated utility sector has changed to negative from stable, reflecting increased financial risk due to lower cash flow and holding company leverage at its highest level since 2008. These factors will reduce the ratio of funds from operations (FFO) to debt by up to 200 basis points over the next 12-18 months.

» **Cash flow will decline due to a lower contribution from deferred taxes.** The combination of the loss of bonus depreciation and a lower tax rate as a result of the Tax Cuts & Jobs Act (TCJA) means that utilities and their holding companies will lose some of the cash flow contribution from deferred taxes. Since 2010, deferred taxes have contributed around 14% of consolidated FFO, but we see this falling to around 8% through 2019. This will drive down the consolidated ratio of FFO to debt, for a peer group of 42 utility holding companies, from 17% toward 15% over the outlook period.

» **Regulatory and management responses may not improve financials until 2020.** Some state regulatory commissions have issued credit-supportive rate orders to offset reduced cash flow because of tax reform, and several holding companies are executing plans to strengthen their balance sheets. But it could take longer than 12-18 months before sector-wide financial metrics improve.

» **High leverage will persist due to growing capital spending and rising dividends.** For our peer group, consolidated debt to EBITDA of 5.1x in 2017 was at a 10-year high, and a consolidated debt to equity ratio of 1.5x was at its highest level since 2008. These leverage metrics will remain elevated given higher capital spending in 2018 and 2019, rising dividends and a continued heavy reliance on debt financing.

» **What could change our outlook** The outlook could return to stable if we expect the sector's financial profile to stabilize, even if that is at today's lower levels. A positive outlook could be considered if we expect a recovery in key cash flow metrics where consolidated cash flow starts to improve by roughly 15%-20% or the ratio of consolidated FFO to debt indicates a return to the 17%-19% range. Underpinning each of these scenarios is a supportive regulatory environment across most US jurisdictions.

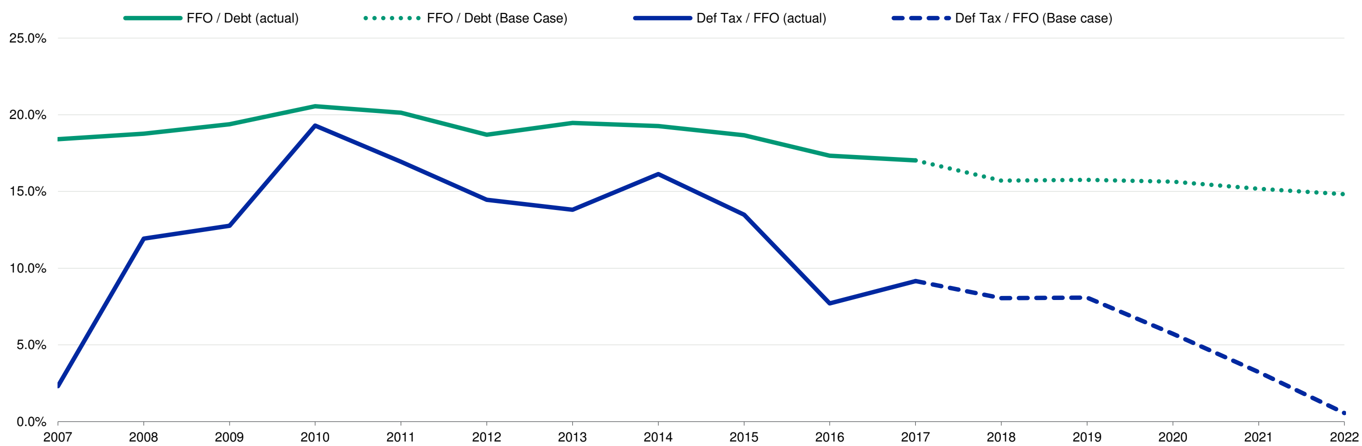
Cash flow will decline due to a lower contribution from deferred taxes

The combination of a lower tax rate and the loss of bonus depreciation as a result of the federal Tax Cuts & Jobs Act (TCJA) in December 2017 means that utilities and their holding companies will lose some of the cash flow contribution from deferred taxes on an ongoing basis, as shown in Exhibit 1.

For nearly a decade, bonus depreciation has created large timing differences between the book and tax amounts that utility holding companies report and pay as tax expense, and has resulted in a very low cash tax payment rate for the sector. Consequently, virtually all of the revenue that utilities have collected from customers to cover tax expense has been retained by the company as deferred tax liabilities, rather than paid to the Internal Revenue Service in any given year. These deferred taxes have boosted cash flow measures[1] significantly, accounting for roughly 14% of consolidated FFO, on average, since 2010.

Now, with the reduction in the corporate tax rate to 21% from 35%, utilities will collect less revenue from customers (since their federal tax expense is lower) and retain less cash via deferred taxes. As a result, the deferred-tax contribution to consolidated FFO will fall to around 8% through 2019, from an average of 14% since 2010, based on our financial forecast using a peer group of 42 regulated utility holding companies with 10 years of historical data (see Appendix A for a listing of holding company peers and Appendix D for a description of our key forecast assumptions). We also see the same trend for a peer group of 102 utility operating companies with 10 years of historical data. This decline will drive consolidated FFO to debt metrics down toward 15% from 17% and operating company FFO to debt to 20% from 24% over the next 12-18 months. See Appendix B for a list of the 102 operating companies.

Exhibit 1
Consolidated FFO to debt will decline as a result of lower deferred taxes



Key assumption: Cash tax rates of 0% in 2018 and 2019, 5% in 2020, 10% in 2021 and 15% in 2022
Source: Moody's Investors Service

Because outlooks represent our forward-looking view on business conditions that factor into our ratings, a negative (positive) outlook suggests that negative (positive) rating actions are more likely on average. However, the industry outlook does not represent a sum of upgrades, downgrades or ratings under review, or an average of the rating outlooks of issuers in the industry, but rather our assessment of the main direction of business fundamentals within the overall industry.

The loss of bonus depreciation means that most companies will start paying cash tax earlier than under the previous law. Under the TCJA, utilities can claim less in depreciation expense for tax purposes and will have higher taxable income. Notwithstanding the change in law, we still expect holding companies to pay little or no cash tax in 2018 and 2019 because most have significant accumulated net operating losses driven by past claims of bonus depreciation, production tax credits from renewable generation or other tax offsets.

Lowering the tax rate also means that utilities will have over-collected for tax expenses in the past because they charged for future tax expense assuming a 35% tax rate. As utilities refund the excess collection to customers, cash flow will be reduced, with the decline likely spread over 20 years or more.

Regulatory and management responses may not improve financials until 2020

Regulatory commissions and utility management teams are taking important first steps in addressing increased financial risk, but we believe that it will take longer than 12-18 months for the majority of the sector to show any material financial improvement from such efforts.

There are two principal approaches for a utility seeking to take mitigating action against rising financial risk. The first option is to pursue financial relief from regulators, which we see most companies doing across the industry in response to tax reform. The second is "self-help," where management teams alter financial policies to improve cash flow or their balance sheet. These efforts could include cutting operating or capital costs, issuing equity, reducing debt, selling non-core assets or slowing dividend growth. Such strategies were popular during the early 2000s period known as "back to basics," when many companies shed unregulated and international assets, reduced debt and focused on strengthening core regulatory relationships.

Regulation addressing tax reform

So far, we have seen credit positive developments in some states in response to tax reform, described in the box below. Most of these measures are positive because they provide incremental cash flow that will be used to replace some of the cash lost due to tax reform.

Some regulatory commissions have allowed early tax reform relief

In Florida, the Florida Public Service Commission allowed several of the state's utilities including Florida Power & Light Company (A1 stable), Duke Energy Florida, LLC (A3 stable) and Tampa Electric Company (A3 stable) to use the bulk of customer refunds resulting from tax reform changes to offset rate increases for power restoration costs associated with the utilities' response to Hurricane Irma. Duke Energy Florida was also permitted to use a portion of the savings to accelerate the depreciation of existing coal plants.

In April, the Georgia Public Service Commission (GPSC) approved a tax reform settlement agreement allowing Georgia Power Company (A3 negative) to increase its authorized retail equity ratio, currently around 51%, to the utility's actual equity capitalization percentage or 55% (whichever is lower) until its next rate case filing, scheduled to be filed 1 July 2019.

In May, the Alabama Public Service Commission approved two supportive rate proposal requests by Alabama Power Company (A1 negative), including 1) a plan designed to improve the company's balance sheet and credit quality over time by gradually increasing its equity ratio to 55% by 2025 and 2) allowing up to $30 million of excess deferred tax liability deferrals to offset under-recovered fuel costs.

In Indiana, Northern Indiana Public Service Company (Baa1 stable) has reached a gas rate settlement that, if approved by the Indiana Utility Regulatory Commission, would defer the cash outflows associated with unprotected deferred tax liabilities until 2020.

While we expect very supportive regulatory outcomes in states such as Florida, Georgia and Alabama—three of the most credit-supportive regulatory environments in the US—other states will likely have more moderate allowances for increased rates and cash flow recovery in regard to tax reform. So far, many state commissions have provided for the 21% tax rate to be implemented into rates in 2018, but have said they will address the return of excess deferred tax liabilities to customers at a later date—under a separate proceeding or at the time of a utility's next general rate case. This adds a degree of uncertainty to the ultimate timing of any cash flow impact on the sector.

Management efforts to address financial risk

Many companies are executing plans to strengthen their balance sheets in the face of increased financial risk, including incremental equity issuances beyond their pre-tax reform plans, selling assets or modest capex reductions. Some of these actions are defensive measures brought about by tax reform, while others are reactions to developments such as funding acquisitions, regulatory and political uncertainties, large capital programs or natural disasters. Other companies, although faced with negative credit trends, are making no material changes to financial policies.

Exhibit 2 shows a list of selected holding companies with a negative outlook or ratings under review for downgrade, as well as their planned responses to deal with heightened financial risks or other negative credit conditions.

Exhibit 2

Management teams are pursuing different avenues to relieve financial and credit risk
Holding companies with a negative outlook and under review for downgrade (RUR-D) as of 18 June 2018

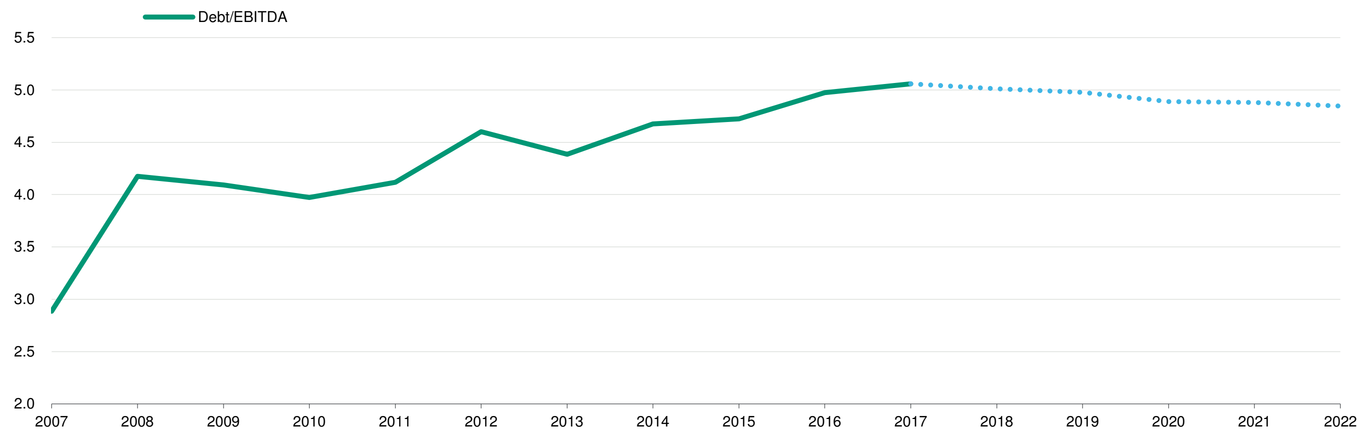
Company	Rating	Outlook	Pursuing Regulatory Relief for Tax Reform	Incremental Equity Issuance	Selling Assets	Incremental Capex Reduction	% of Annual Capex Reduced	Dividend Reduction
ALLETE, Inc.	A3	Negative	Yes	No	No	No	NA	No
Consolidated Edison, Inc.	A3	Negative	Yes	No	No	No	NA	No
Edison International	A3	Negative	Yes	No	No	No	NA	No
Integrys Holding, Inc.	A3	RUR-D	Yes	No	No	No	NA	No
OGE Energy Corp.	A3	Negative	Yes	No	No	No	NA	No
WEC energy Group, Inc.	A3	RUR-D	Yes	No	No	No	NA	No
WGL Holdings, Inc.	A3	Negative	Yes	No	No	No	NA	No
Alliant Energy Corporation	Baa1	Negative	Yes	No	No	No	NA	No
CenterPoint Energy, Inc.	Baa1	Negative	Yes	Yes	No	No	NA	No
Duke Energy Corporation	Baa1	Negative	Yes	Yes	No	Yes	2%	No
PG&E Corporation	Baa1	Negative	Yes	No	No	No	NA	Yes
Sempra Energy	Baa1	Negative	Yes	Yes	Yes	No	NA	No
Dominion Energy, Inc.	Baa2	Negative	Yes	Yes	Yes	Yes	11%	No
Entergy Corporation	Baa2	Negative	Yes	Yes	No	No	NA	No
Southern Company (The)	Baa2	Negative	Yes	Yes	Yes	No	NA	No
Cleco Corporate Holdings LLC	Baa3	RUR-D	Yes	No	No	No	NA	No
Emera Inc.	Baa3	Negative	Yes	Yes	No	No	NA	No
SCANA Corporation	Ba1	RUR-D	Yes	No	No	No	NA	No

Source: Company announcements and Moody's Investors Service

High leverage will persist because of significant capital spending and rising dividends

With roughly $600 billion of adjusted debt at year-end 2017, our peer group of 42 utility holding companies are exhibiting a 10-year high consolidated ratio of debt to EBITDA (5.1x in 2017) and the highest consolidated debt to equity ratio (1.5x in 2017) since 2008, the height of the financial crisis. As shown in Exhibit 3, these leverage ratios will remain elevated amid higher capital spending in 2018 and in 2019, rising dividends, and a continued heavy reliance on debt financing for negative free cash flow.

Exhibit 3
The ratio of debt to EBITDA for utility holding companies will likely remain at 10-year highs

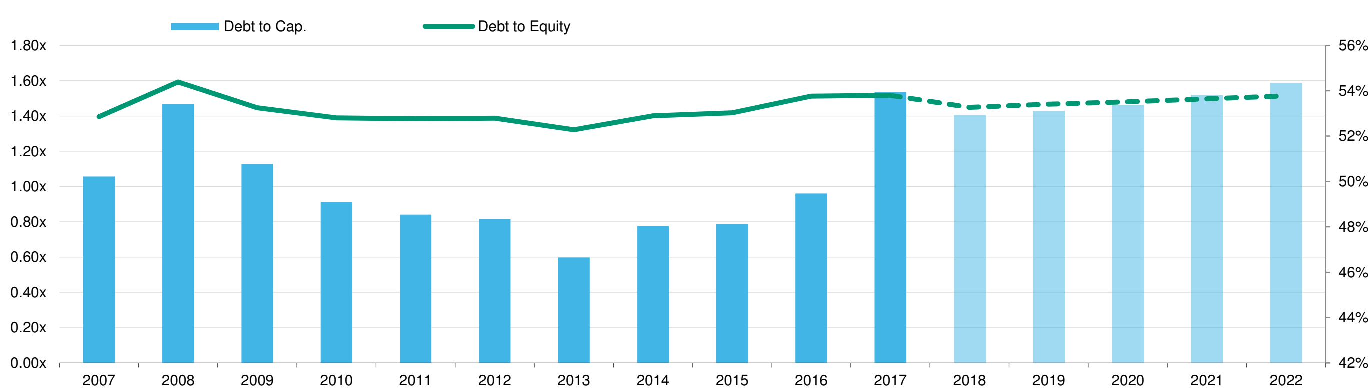


Source: Moody's Investors Service

Because of the lower tax rate, deferred tax liabilities were reduced, which negatively impacts our adjusted capitalization ratios. The deferred tax revaluation has increased the adjusted debt to capitalization ratio to 54% in 2017, from 49% in 2016, since it reduces the amount of total capitalization (debt + equity + deferred taxes) and reclassifies the excess deferred tax liabilities as a long-term regulatory liability owed to customers.

As Exhibit 4 shows, leverage is expected to remain high compared with historical levels, despite a significant amount of equity being issued in 2018. In 2018 we made a simplifying assumption that $20 billion of equity would be issued, offsetting a similar amount of debt that would otherwise have been used to fund negative free cash flow. That assumption acknowledges that several companies have announced equity issuances in 2018, including Duke Energy Corporation (Baa1 negative), Dominion Energy, Inc. (Baa2 negative) and Entergy Corporation (Baa2 negative). Without this equity, the ratio of debt to capitalization would have been 55% through 2022 and debt to equity would have been 1.5x, trending to 1.6x in 2022.

Exhibit 4
Despite equity issuance in 2018, leverage metrics will remain much higher than historical levels
Debt to Cap. (%) and Debt to Equity (x)



Source: Moody's Investors Service

Holding company leverage has been increasing in recent years due to factors such as highly levered mergers and acquisitions, investments in non-regulated activities including renewable energy portfolios and midstream ventures, and using holding company debt as a source for equity infusions into operating subsidiaries. We do not incorporate unregulated investment into our forecast scenarios, but we still see increasing debt levels because of high capital investments and rising dividends.

Capital spending is likely to increase

Utility companies continue to spend significant capital on their rate base through smart-grid investments, system resilience measures and carbon transition efforts, including renewable generation assets. This is likely to keep spending levels high for the next several years. A trend of higher capital spending could also ensue if companies see the revenue reduction from tax reform, and the consequent reduction in customer bills, as an opportunity to make additional capital investments that could be recovered in rates without increasing customer bills above their pre-tax reform levels.

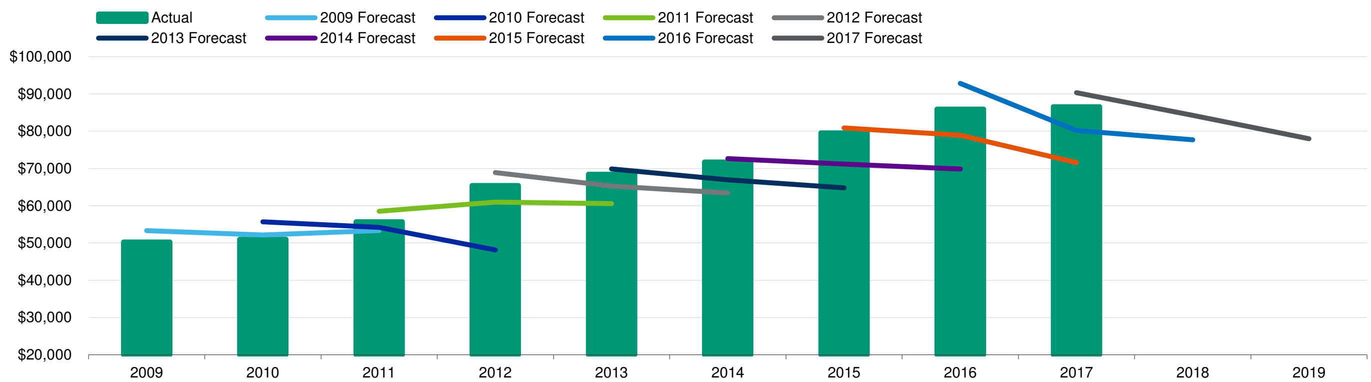
While many companies are estimating a steady decline in capital spending after 2018, our base-case projections assume that their capital spending will continue to increase, at about 5.0% each year, compared with a 2012-2017 compound annual growth rate (CAGR) of 5.7%.

As Exhibit 5 shows, while companies often project a downward trajectory in capital spending, the level of capital actually deployed frequently exceeds projections by a wide margin. In fact, for 25 holding companies that have reported 3-year capex projections since 2009 (see Appendix C for a list of companies), aggregate capital spending has always increased despite projections that usually predict a declining trend.

Exhibit 5

Utility capital spending is often projected to decline, but has actually grown annually since 2009

Annual 3-year capex projections for 25 regulated utility holding companies



Source: SPGMI

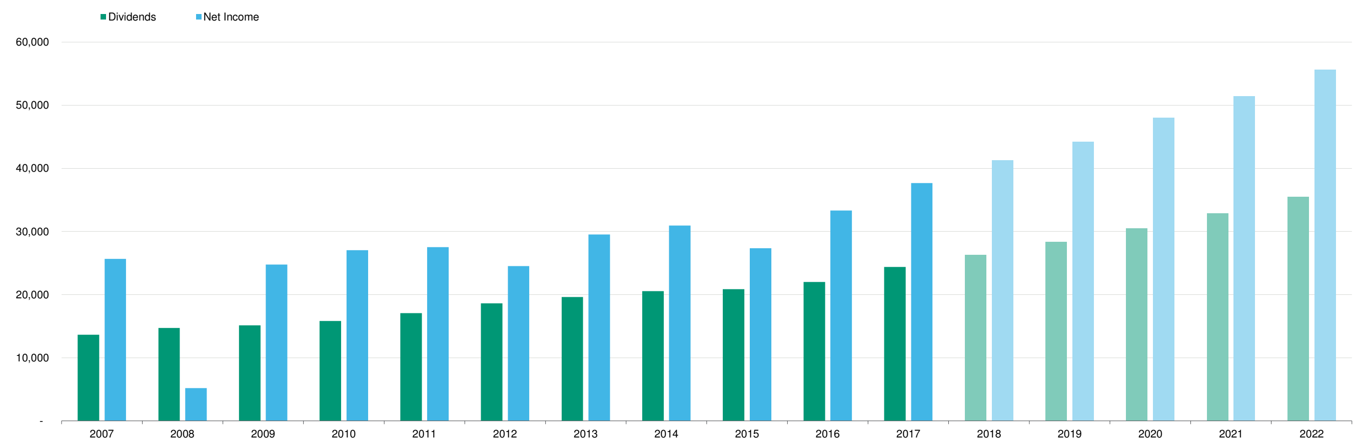
Dividends will continue to rise

As shown in Exhibit 6, we also expect that dividends will continue to increase, consistent with 2018 earnings call guidance indicating that payout policies are either unchanged or growing. In our base case forecast, we assume dividends increase at 8% year-over-year, which is the same growth rate as shown by net income.

Exhibit 6

The 10-year trend of increasing overall dividends is likely to continue through 2022

Actual dividends/net income (dark green/blue) and projected dividends/net income (light green/blue)



Source: Moody's Investors Service

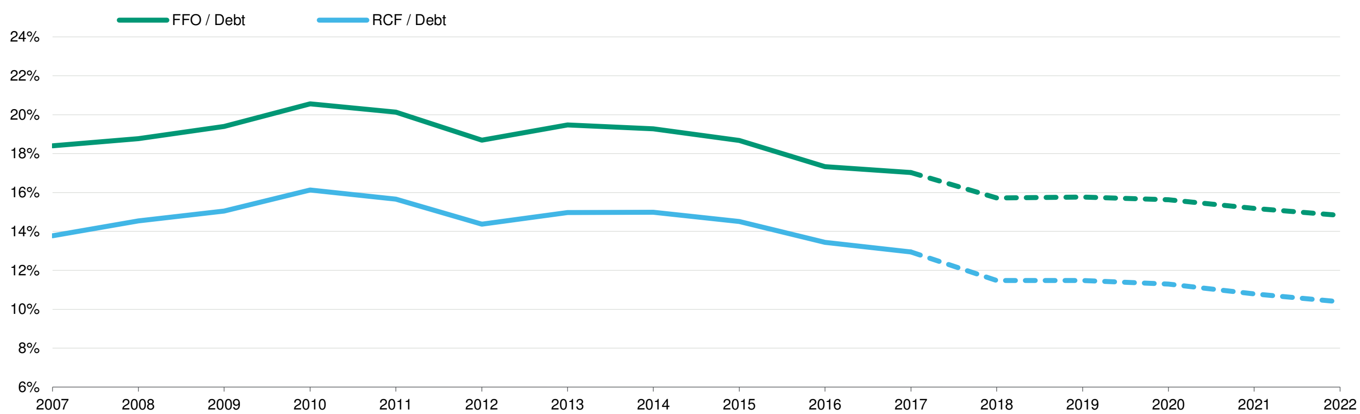
What could change our outlook

Stable outlook

The outlook could return to stable if we expect that the sector's financial profile will stabilize at today's lower levels, with consolidated FFO to debt metrics remaining steady. Exhibit 7 shows such stability could happen as early as 2019, with both FFO to debt and retained cash flow (RCF) to debt remaining between 15%-16% and 11%-12%, respectively, through year-end 2020.

Exhibit 7

A stable financial trend could emerge in 2019-2020 if cash flow growth keeps pace with debt



Key assumption: Cash tax rates of 0% in 2018 and 2019, 5% in 2020, 10% in 2021 and 15% in 2022

Source: Moody's Investors Service

We ran alternative scenarios to our base case forecast, including an upside case that assumes an improved financial performance by utilities and a downside case that assumes additional financial challenges.

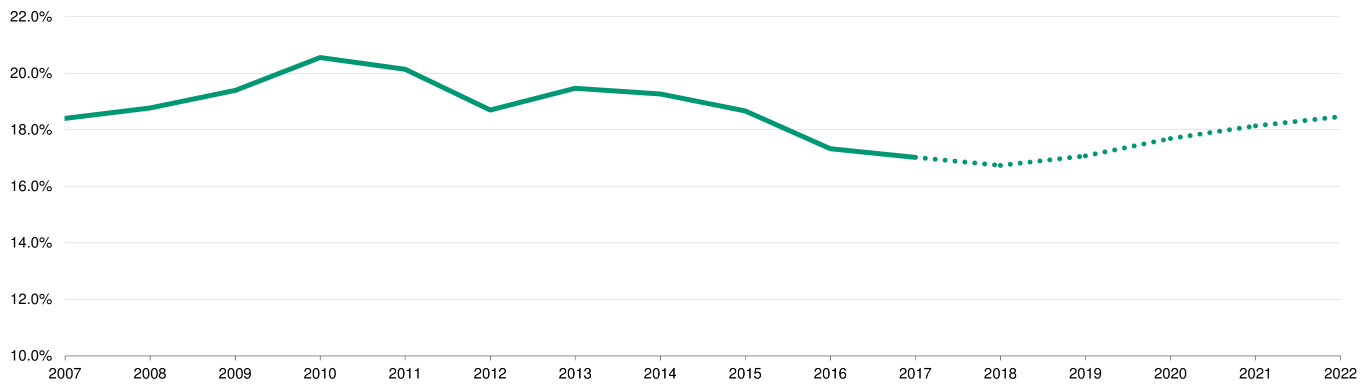
Positive outlook

A positive outlook would be possible if we expect a recovery in key cash flow metrics, such as consolidated FFO to debt returning to the 17%-19% range. This is the case in our upside projection scenario, which reflects a greater use of equity funding of negative free cash flow and very strong recovery provisions allowed by regulators. In Exhibit 8, we assumed a 5% annual decline in capital spending after 2019, simulating the downward trend in industry-reported projections.

Exhibit 8

The sector outlook could change to positive if FFO to debt rebounds as projected in our upside case

Actual historical FFO to debt (solid line) and as-projected in our upside case (dotted line)



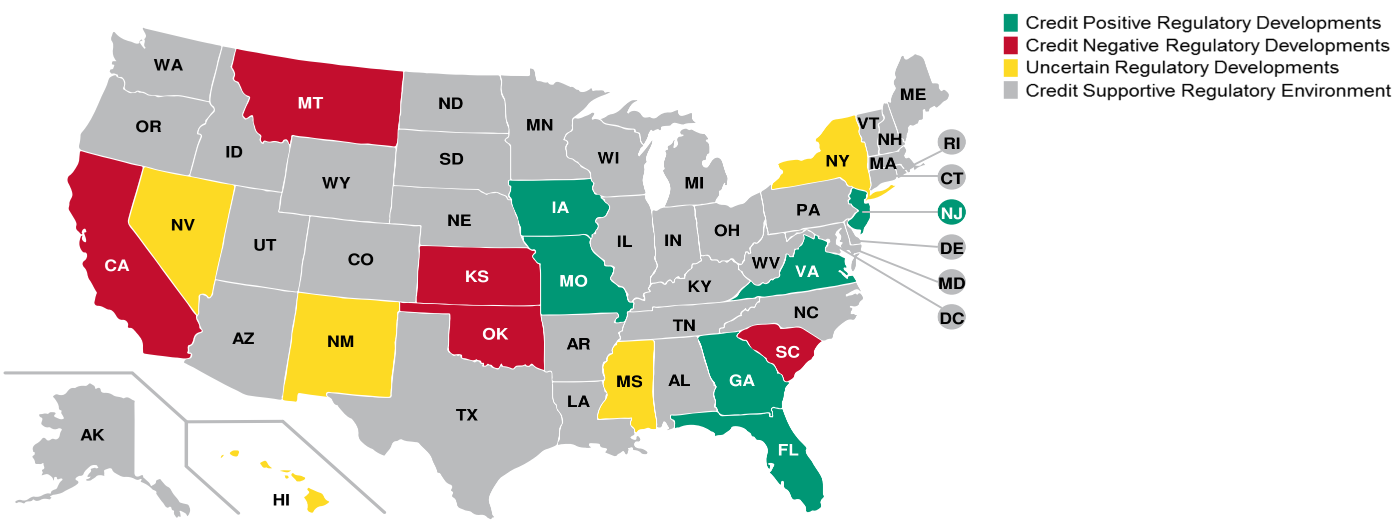
Source: Moody's Investors Service

Most state regulatory environments remain steadily supportive of credit

The underpinning of the sector outlook potentially returning to stable or changing to positive is a supportive regulatory environment. Exhibit 9 shows that, even today, most state jurisdictions remain predictably supportive of utility credit (grey), while some states have regulatory or legislative developments that could have positive (green), negative (red) or uncertain (yellow) impacts on utility credit.

Exhibit 9

Regulatory developments in most states continue to be stable and supportive of credit



Source: Moody's Investors Service

Appendix A - Holding company peer group

Exhibits 10 and 11 list the 42 regulated utility holding companies from which financial figures were derived by aggregating the annual data from 2007-2017 and applying key assumptions (see Appendix D) to drive our forecast scenarios. These companies were selected based on having ten years of historical data.

Exhibit 10

Companies 1-22 of 42 holding companies, sorted by highest to lowest consolidated CFO / Debt

$ in millions, as of the last twelve months available

Issuer	Rating and Outlook	CFO	Total Debt	CFO / Debt	Equity	Capex	Dividends
PG&E Corporation	Baa1 Negative	$ 5,908	$ 21,352	28%	$ 19,576	$ 5,900	$ 766
ALLETE, Inc.	A3 Negative	$ 465	$ 1,747	27%	$ 2,088	$ 275	$ 111
OGE Energy Corp.	A3 Negative	$ 851	$ 3,346	25%	$ 3,800	$ 728	$ 254
Edison International	A3 Negative	$ 3,749	$ 15,920	24%	$ 12,692	$ 4,072	$ 790
Vectren Utility Holdings, Inc.	A2 Stable	$ 419	$ 1,816	23%	$ 1,766	$ 569	$ 125
Ameren Corporation	Baa1 Stable	$ 2,040	$ 9,477	22%	$ 7,230	$ 2,264	$ 441
Pinnacle West Capital Corporation	A3 Stable	$ 1,205	$ 5,661	21%	$ 5,005	$ 1,439	$ 295
WEC Energy Group, Inc.	A3 Rating(s) Under Review	$ 2,292	$ 10,809	21%	$ 10,067	$ 2,080	$ 679
Public Service Enterprise Group Incorporated	Baa1 Stable	$ 3,053	$ 14,503	21%	$ 14,006	$ 4,049	$ 879
NextEra Energy, Inc.	Baa1 Stable	$ 6,437	$ 31,715	20%	$ 33,116	$ 9,035	$ 2,040
IDACORP, Inc.	Baa1 Stable	$ 440	$ 2,178	20%	$ 2,267	$ 281	$ 113
Exelon Corporation	Baa2 Stable	$ 8,073	$ 40,215	20%	$ 30,241	$ 7,612	$ 1,274
WGL Holdings, Inc.	A3 Negative	$ 505	$ 2,683	19%	$ 1,733	$ 466	$ 105
CMS Energy Corporation	Baa1 Stable	$ 1,782	$ 9,930	18%	$ 4,535	$ 1,739	$ 382
CenterPoint Energy, Inc.	Baa1 Negative	$ 1,635	$ 9,253	18%	$ 4,857	$ 1,485	$ 466
Evergy, Inc.	Baa2 Stable	$ 879	$ 4,980	18%	$ 4,920	$ 595	$ 257
DTE Energy Company	Baa1 Stable	$ 2,414	$ 13,894	17%	$ 10,064	$ 2,266	$ 659
American Electric Power Company, Inc.	Baa1 Stable	$ 4,413	$ 25,446	17%	$ 18,391	$ 6,505	$ 1,207
Consolidated Edison, Inc.	A3 Negative	$ 3,261	$ 18,992	17%	$ 15,514	$ 3,701	$ 814
Pepco Holdings, LLC	Baa2 Stable	$ 1,068	$ 6,267	17%	$ 9,488	$ 1,367	$ 313
PNM Resources, Inc.	Baa3 Positive	$ 493	$ 3,048	16%	$ 1,689	$ 524	$ 80
Puget Energy, Inc.	Baa3 Stable	$ 974	$ 6,066	16%	$ 3,649	$ 1,087	$ 153

Source: Moody's Investors Service

Appendix A (continued) - Holding company peer group

Exhibit 11

Companies 23-42 of 42 holding companies, sorted by highest to lowest consolidated CFO / Debt

$ in millions, as of the last twelve months available

Issuer	Rating and Outlook	CFO	Total Debt	CFO / Debt	Equity	Capex	Dividends
Hawaiian Electric Industries, Inc.	WR Stable	$ 418	$ 2,614	16%	$ 2,117	$ 546	$ 137
Berkshire Hathaway Energy Company	A3 Stable	$ 6,287	$ 42,392	15%	$ 28,667	$ 4,886	$ -
TECO Energy, Inc.	Baa2 Stable	$ 624	$ 4,276	15%	$ 2,879	$ 709	$ -
Black Hills Corporation	Baa2 Stable	$ 483	$ 3,331	15%	$ 1,871	$ 338	$ 101
Alliant Energy Corporation	Baa1 Negative	$ 873	$ 6,036	14%	$ 4,217	$ 1,520	$ 284
Entergy Corporation	Baa2 Negative	$ 2,909	$ 20,475	14%	$ 7,806	$ 3,940	$ 634
Spire Inc.	Baa2 Stable	$ 400	$ 2,872	14%	$ 2,138	$ 474	$ 102
Southern Company (The)	Baa2 Negative	$ 7,220	$ 52,269	14%	$ 26,339	$ 9,251	$ 2,505
SCANA Corporation	Ba1 Rating(s) Under Review	$ 956	$ 7,189	13%	$ 5,305	$ 1,114	$ 349
PPL Corporation	Baa2 Stable	$ 2,990	$ 22,682	13%	$ 11,409	$ 3,287	$ 1,098
Sempra Energy	Baa1 Negative	$ 3,627	$ 28,450	13%	$ 15,532	$ 3,994	$ 904
Duke Energy Corporation	Baa1 Negative	$ 6,849	$ 55,677	12%	$ 41,554	$ 8,043	$ 2,455
Eversource Energy	Baa1 Stable	$ 1,906	$ 15,542	12%	$ 11,219	$ 2,440	$ 615
Duquesne Light Holdings, Inc.	Baa3 Stable	$ 318	$ 2,596	12%	$ 1,078	$ 300	$ 103
Dominion Energy, Inc.	Baa2 Negative	$ 4,329	$ 38,692	11%	$ 18,857	$ 5,436	$ 2,050
NiSource Inc.	Baa2 Stable	$ 1,008	$ 9,429	11%	$ 4,435	$ 1,791	$ 238
FirstEnergy Corp.	Baa3 Stable	$ 2,247	$ 22,839	10%	$ 8,470	$ 3,002	$ 672
Cleco Corporate Holdings LLC	Baa3 Rating(s) Under Review	$ 287	$ 2,929	10%	$ 2,070	$ 252	$ 75
DPL Inc.	Ba2 Positive	$ 157	$ 1,692	9%	$ (536)	$ 107	$ -
IPALCO Enterprises, Inc.	Baa3 Stable	$ 253	$ 2,747	9%	$ 564	$ 179	$ 107

Source: Moody's Investors Service

Appendix B - Operating company peer group

Exhibits 12-15 list 102 operating companies that were analyzed as part of our financial comparisons. These companies were selected based on having ten years of historical data. Our base case scenario shows the aggregate cash flow to debt ratios of these companies dropping by 400 basis points over the next 12-18 months.

Exhibit 12

Companies 1-30 of 102 operating companies, sorted by highest to lowest CFO / Debt

$ in millions, as of the last twelve months available

Issuer	Rating and Outlook	CFO	Total Debt	CFO / Debt	Capex	Dividends
Metropolitan Edison Company	A3 Stable	$ 458	$ 1,060	43%	$ 152	$ 80
Atmos Energy Corporation	A2 Stable	$ 1,095	$ 3,371	32%	$ 1,300	$ 203
Southern California Gas Company	A1 Stable	$ 1,299	$ 4,111	32%	$ 1,433	$ 1
Baltimore Gas and Electric Company	A3 Stable	$ 945	$ 3,029	31%	$ 921	$ 199
Pennsylvania Power Company	Baa1 Stable	$ 64	$ 217	30%	$ 51	$ 20
Gulf Power Company	A2 Stable	$ 420	$ 1,420	30%	$ 235	$ 175
Tampa Electric Company	A3 Stable	$ 744	$ 2,530	29%	$ 660	$ 324
Duquesne Light Company	A3 Stable	$ 387	$ 1,321	29%	$ 282	$ 90
Madison Gas and Electric Company	A1 Stable	$ 136	$ 473	29%	$ 131	$ 32
Spire Alabama Inc.	A2 Stable	$ 136	$ 476	29%	$ 121	$ 32
Wisconsin Public Service Corporation	A2 Stable	$ 414	$ 1,465	28%	$ 363	$ 120
Kentucky Utilities Co.	A3 Stable	$ 690	$ 2,460	28%	$ 496	$ 235
Pacific Gas & Electric Company	A3 Negative	$ 5,860	$ 21,051	28%	$ 5,931	$ 542
Florida Power & Light Company	A1 Stable	$ 3,764	$ 13,562	28%	$ 4,728	$ 1,050
Consumers Energy Company	(P)A2 Stable	$ 1,865	$ 6,734	28%	$ 1,702	$ 494
Indiana Gas Company, Inc.	A2 Stable	$ 159	$ 574	28%	$ 209	$ -
Tucson Electric Power Company	A3 Stable	$ 435	$ 1,596	27%	$ 401	$ 70
Southern California Edison Company	A2 Negative	$ 3,777	$ 13,937	27%	$ 3,981	$ 657
Puget Sound Energy, Inc.	Baa1 Stable	$ 1,120	$ 4,136	27%	$ 1,036	$ 262
Northern States Power Company (Minnesota)	A2 Stable	$ 1,425	$ 5,296	27%	$ 920	$ 516
New Jersey Natural Gas Company	Aa2 Negative	$ 205	$ 764	27%	$ 185	$ 68
Louisville Gas & Electric Company	A3 Stable	$ 529	$ 2,021	26%	$ 527	$ 139
PPL Electric Utilities Corporation	A3 Stable	$ 937	$ 3,583	26%	$ 1,224	$ 332
Entergy New Orleans, Inc.	Ba1 Stable	$ 139	$ 533	26%	$ 130	$ 69
Ohio Power Company	A2 Stable	$ 655	$ 2,539	26%	$ 634	$ 178
MidAmerican Energy Company	A1 Stable	$ 1,391	$ 5,529	25%	$ 1,887	$ -
San Diego Gas & Electric Company	A1 Negative	$ 1,566	$ 6,246	25%	$ 1,613	$ 275
Oklahoma Gas & Electric Company	A1 Negative	$ 783	$ 3,121	25%	$ 727	$ 105
Southwestern Public Service Company	Baa1 Negative	$ 495	$ 1,988	25%	$ 555	$ 105
Central Hudson Gas & Electric Corporation	A2 Stable	$ 156	$ 636	24%	$ 171	$ 9

Source: Moody's Investors Service

Exhibit 13

Companies 31-60 of 102 operating companies, sorted by highest to lowest CFO / Debt
$ in millions, as of the last twelve months available

Issuer	Rating and Outlook	CFO	Total Debt	CFO / Debt	Capex	Dividends
Northern Illinois Gas Company	A2 Stable	$ 284	$ 1,205	24%	$ 601	$ 70
Questar Gas Company	A2 Negative	$ 192	$ 819	23%	$ 231	$ -
Arizona Public Service Company	A2 Stable	$ 1,229	$ 5,280	23%	$ 1,410	$ 324
Black Hills Power, Inc.	A3 Stable	$ 81	$ 351	23%	$ 75	$ -
Public Service Company of Colorado	A3 Stable	$ 1,166	$ 5,075	23%	$ 1,593	$ 336
Alabama Power Company	A1 Negative	$ 1,883	$ 8,204	23%	$ 2,192	$ 734
Duke Energy Carolinas, LLC	A1 Stable	$ 2,510	$ 10,995	23%	$ 2,575	$ 700
Sierra Pacific Power Company	Baa1 Stable	$ 272	$ 1,194	23%	$ 193	$ 43
Connecticut Natural Gas Corporation	A3 Stable	$ 55	$ 245	23%	$ 64	$ 7
Avista Corp.	Baa1 Negative	$ 447	$ 1,993	22%	$ 407	$ 94
UGI Utilities, Inc.	A2 Stable	$ 256	$ 1,144	22%	$ 328	$ 63
Piedmont Natural Gas Company, Inc.	A2 Negative	$ 500	$ 2,254	22%	$ 559	$ -
Union Electric Company	Baa1 Stable	$ 1,008	$ 4,554	22%	$ 883	$ 355
Rochester Gas & Electric Corporation	A3 Stable	$ 237	$ 1,077	22%	$ 279	$ -
Orange and Rockland Utilities, Inc.	A3 Negative	$ 224	$ 1,019	22%	$ 198	$ 45
Nevada Power Company	Baa1 Stable	$ 694	$ 3,178	22%	$ 283	$ 473
DTE Electric Company	A2 Stable	$ 1,639	$ 7,513	22%	$ 1,560	$ 439
Portland General Electric Company	A3 Stable	$ 603	$ 2,766	22%	$ 520	$ 118
Wisconsin Power and Light Company	A2 Negative	$ 456	$ 2,098	22%	$ 607	$ 129
Duke Energy Indiana, LLC.	A2 Stable	$ 926	$ 4,279	22%	$ 902	$ 300
PacifiCorp	A3 Stable	$ 1,586	$ 7,337	22%	$ 839	$ 750
PECO Energy Company	A2 Stable	$ 680	$ 3,192	21%	$ 756	$ 507
Duke Energy Kentucky, Inc.	Baa1 Stable	$ 103	$ 487	21%	$ 222	$ -
Mississippi Power Company	Ba1 Positive	$ 453	$ 2,153	21%	$ 249	$ (1)
Northern States Power Company (Wisconsin)	A2 Stable	$ 172	$ 825	21%	$ 220	$ 69
Westar Energy, Inc.	Baa1 Stable	$ 957	$ 4,602	21%	$ 778	$ 228
Otter Tail Power Company	A3 Stable	$ 125	$ 603	21%	$ 121	$ 40
Public Service Company of New Hampshire	A3 Stable	$ 287	$ 1,393	21%	$ 313	$ 155
Public Service Electric and Gas Company	A2 Stable	$ 1,829	$ 8,914	21%	$ 2,848	$ -
United Illuminating Company	Baa1 Stable	$ 234	$ 1,154	20%	$ 167	$ 125

Source: Moody's Investors Service

Appendix B (continued) - Operating company peer group

Exhibit 14

Companies 61-90 of 102 operating companies, sorted by highest to lowest CFO / Debt

$ in millions, as of the last twelve months available

Issuer	Rating and Outlook	CFO	Total Debt	CFO / Debt	Capex	Dividends
Spire Missouri Inc.	A1 Stable	$ 267	$ 1,329	20%	$ 294	$ 14
NSTAR Electric Company	A2 Stable	$ 696	$ 3,489	20%	$ 757	$ 378
Delmarva Power & Light Company	Baa1 Stable	$ 324	$ 1,624	20%	$ 421	$ 118
Cleco Power LLC	A3 Stable	$ 305	$ 1,574	19%	$ 242	$ 128
CenterPoint Energy Houston Electric, LLC	A3 Stable	$ 985	$ 5,102	19%	$ 895	$ 180
Dayton Power & Light Company	Baa3 Positive	$ 134	$ 697	19%	$ 91	$ (96)
Virginia Electric and Power Company	A2 Stable	$ 2,562	$ 13,409	19%	$ 2,607	$ 908
Public Service Company of New Mexico	Baa2 Positive	$ 365	$ 1,937	19%	$ 324	$ 61
Washington Gas Light Company	A1 Negative	$ 279	$ 1,487	19%	$ 349	$ 87
Kansas City Power & Light Company	Baa1 Stable	$ 674	$ 3,592	19%	$ 463	$ 215
Oncor Electric Delivery Company LLC	A2 Stable	$ 1,541	$ 8,234	19%	$ 1,678	$ 151
El Paso Electric Company	Baa1 Negative	$ 284	$ 1,525	19%	$ 242	$ 54
Southern Indiana Gas & Electric Company	A2 Stable	$ 157	$ 849	19%	$ 154	$ 55
Appalachian Power Company	Baa1 Stable	$ 828	$ 4,486	18%	$ 828	$ 130
Georgia Power Company	A3 Negative	$ 2,180	$ 11,808	18%	$ 2,942	$ 1,302
Potomac Electric Power Company	Baa1 Stable	$ 502	$ 2,717	18%	$ 614	$ 128
Duke Energy Progress, LLC	A2 Stable	$ 1,489	$ 8,329	18%	$ 1,701	$ 124
Texas-New Mexico Power Company	A3 Stable	$ 93	$ 524	18%	$ 162	$ 36
Public Service Company of Oklahoma	A3 Negative	$ 286	$ 1,606	18%	$ 248	$ 65
Connecticut Light and Power Company	Baa1 Rating(s) Under Review	$ 703	$ 3,977	18%	$ 855	$ 268
Public Service Co. of North Carolina, Inc.	A3 Rating(s) Under Review	$ 131	$ 740	18%	$ 289	$ 41
Consolidated Edison Company of New York, Inc.	A2 Negative	$ 2,743	$ 15,877	17%	$ 3,190	$ 808
Hawaiian Electric Company, Inc.	Baa2 Stable	$ 340	$ 2,007	17%	$ 475	$ 94
DTE Gas Company	A2 Negative	$ 286	$ 1,692	17%	$ 434	$ 106
CenterPoint Energy Resources Corp.	Baa2 Stable	$ 492	$ 2,918	17%	$ 537	$ 579
Entergy Arkansas, Inc.	Baa1 Stable	$ 637	$ 3,780	17%	$ 798	$ 16
Northwest Natural Gas Company	A3 Negative	$ 183	$ 1,093	17%	$ 235	$ 53
Duke Energy Ohio, Inc.	Baa1 Positive	$ 418	$ 2,502	17%	$ 734	$ 25
Atlantic City Electric Company	Baa2 Positive	$ 219	$ 1,338	16%	$ 299	$ 67
Southwestern Electric Power Company	Baa2 Stable	$ 475	$ 2,923	16%	$ 472	$ 116

Source: Moody's Investors Service

Appendix B (continued) - Operating company peer group

Exhibit 15

Companies 91-102 of 102 operating companies, sorted by highest to lowest CFO / Debt

$ in millions, as of the last twelve months available

Issuer	Rating and Outlook	CFO	Total Debt	CFO / Debt	Capex	Dividends
Idaho Power Company	A3 Stable	$ 386	$ 2,418	16%	$ 274	$ 115
Entergy Mississippi, Inc.	Baa1 Stable	$ 239	$ 1,513	16%	$ 412	$ 26
Entergy Texas, Inc.	Baa3 Stable	$ 257	$ 1,627	16%	$ 369	$ -
NorthWestern Corporation	Baa2 Stable	$ 339	$ 2,166	16%	$ 277	$ 103
Wisconsin Electric Power Company	A2 Stable	$ 861	$ 5,665	15%	$ 685	$ 241
Commonwealth Edison Company	A3 Stable	$ 1,436	$ 9,489	15%	$ 2,163	$ 434
Berkshire Gas Company	A3 Positive	$ 10	$ 68	14%	$ 17	$ -
Duke Energy Florida, LLC.	A3 Stable	$ 1,072	$ 7,577	14%	$ 1,256	$ -
South Carolina Electric & Gas Company	Baa3 Rating(s) Under Review	$ 754	$ 5,504	14%	$ 813	$ 322
Kentucky Power Company	Baa2 Negative	$ 129	$ 946	14%	$ 110	$ 26
Interstate Power and Light Company	Baa1 Negative	$ 338	$ 2,834	12%	$ 756	$ 154
South Jersey Gas Company	A2 Negative	$ 99	$ 994	10%	$ 246	$ 20

Source: Moody's Investors Service

Appendix C - Holding company capital spending peer group

The 25 holding companies incorporated into Exhibit 5 were selected based upon having 3-year publicly disclosed capital spending projections since in every year since 2009 and being a part of our larger 42 holding company peer group. Those companies are listed in Exhibit 16 below, sorted by rating category.

Exhibit 16

Capital spending for 25 holding companies has increased, in aggregate, year-over-year since 2016
($ millions)

		Capital Expenditures					
		2016		2017		LTM Mar 18	
Consolidated Edison, Inc.	A3 Negative	$	3,898	$	3,703	$	3,701
Edison International	A3 Negative	$	3,790	$	3,879	$	4,072
OGE Energy Corporation	A3 Negative	$	660	$	810	$	728
Pinnacle West Capital Corporation	A3 Stable	$	1,289	$	1,424	$	1,439
Xcel Energy, Inc.	A3 Stable	$	3,225	$	3,238	$	3,363
Alliant Energy Corporation	Baa1 Negative	$	1,182	$	1,456	$	1,520
Ameren Corporation	Baa1 Stable	$	2,164	$	2,204	$	2,264
American Electric Power Company, Inc.	Baa1 Stable	$	5,039	$	5,945	$	6,505
CenterPoint Energy, Inc.	Baa1 Negative	$	1,423	$	1,435	$	1,485
CMS Energy Corporation	Baa1 Stable	$	1,689	$	1,682	$	1,739
DTE Energy Company	Baa1 Stable	$	2,082	$	2,294	$	2,266
PG&E Corporation	Baa1 Negative	$	5,662	$	5,646	$	5,900
Duke Energy Corporation	Baa1 Negative	$	8,089	$	8,116	$	8,043
Public Service Enterprise Group Inc.	Baa1 Stable	$	4,098	$	4,058	$	4,049
Sempra Energy	Baa1 Negative	$	4,153	$	3,951	$	3,994
Dominion Energy, Inc.	Baa2 Negative	$	6,054	$	5,768	$	5,436
Entergy Corporation	Baa2 Negative	$	4,005	$	3,900	$	3,940
Exelon Corporation	Baa2 Stable	$	8,672	$	7,741	$	7,612
Evergy, Inc.	Baa2 Stable	$	626	$	591	$	595
NiSource Inc.	Baa2 Stable	$	1,517	$	1,733	$	1,791
PPL Corporation	Baa2 Stable	$	2,999	$	3,210	$	3,287
Southern Company (The)	Baa2 Negative	$	7,537	$	8,940	$	9,251
FirstEnergy Corporation	Baa3 Stable	$	3,253	$	3,117	$	3,002
PNM Resources, Inc.	Baa3 Positive	$	622	$	521	$	524
SCANA Corporation	Ba1 Rating(s) Under Review	$	1,566	$	1,229	$	1,114
Group Total		**$**	**85,291**	**$**	**86,592**	**$**	**87,620**

Source: Company 10K filings, Moody's standard adjustments

Appendix D - 2018-2022 forecast assumptions

Key Base Case assumptions

- Projected numbers are based on the consolidated financials of a fully regulated utility holding company
- "Forward test year" (e.g., 2019 net income is derived from 2018 rate base plus 2019 capex less 2019 depreciation less 2019 deferred tax liability (DTL), adjusted for normalization of excess DTLs returned to customers)
- 50% equity layer used for rate making purposes, as opposed to the holding company capital structure that is roughly 60/40 debt/equity
- Cash tax rates: 2018- 0%, 2019- 0%, 2020- 5%, 2021- 10%, 2022- 15%
- Additional cash inflow from operations that exactly offsets the cash outflow due to normalized excess deferred tax liabilities returned to customers
- Capex - 5 year projected CAGR is 5.0% versus the 5 year historical CAGR of 5.7%
- Dividend growth is set to match Net Income growth, which is roughly 8% year-over-year
- $20 billion of equity issuance in 2018 to reflect holdco efforts to strengthen their balance sheets
- Funding percentage of negative free cash flow is 88/12 debt/equity; set to keep debt and equity CAGR equivalent at about 6%

Key differences in Upside Case assumptions

- 53% equity layer in rates
- Cash tax rates: 2018- 0%, 2019- 0%, 2020- 3%, 2021- 5%, 2022- 10%
- Regulators approve a cash inflow that is twice the size of the cash outflow due to normalized excess deferred tax liabilities returned to customers
- 2019 Capex is flat to 2018 and declines 5% year-over-year thereafter
- Funding percentage of negative free cash flow is 60/40 debt/equity (debt CAGR of 2%, equity CAGR of 7%)

Key differences in Downside Case assumptions

- 4% inflation on O&M, Taxes and Other OpEx
- Regulators approve a cash inflow that is half the size of the cash outflow due to normalized excess deferred tax liabilities returned to customers
- 7% Capex growth year-over-year
- Funding of negative free cash flow is 100% debt (debt CAGR of 7.8% vs. equity CAGR of 5.0%)

Moody's related publications

Sector In-Depth:

» Offshore Wind is Ready for Prime Time 29 March 2018

» Tax Reform is Credit Negative for Regulated Utilities Sector, but Impact Varies by Company 24 January 2018

» Cross-Sector – US: FAQ on the Credit Impact of New Tax Law 24 January 2018

» Cross-Sector – US: Corporate Tax Cut is Credit Positive, While Effects of Other Provisions Vary by Sector 21 December 2017

» Regulated Electric & Gas Utilities – US: Insulating Utilities from Parent Contagion Risk is Increasingly a Focus of Regulators 18 September 2017

» Renewable Energy - Global: Falling Cost of Renewables Reduces Risks to Paris Agreement Compliance 6 September 2017

» Renewable Energy – Global: Renewables Sector Risks Shift as Competition Reduces Reliance on Government Subsidy 6 September 2017

Rating Methodologies:

» Regulated Electric and Gas Utilities 23 June 2017

» Unregulated Utilities and Unregulated Power Companies 17 May 2017

» Regulated Electric and Gas Networks 16 March 2017

» U.S. Electric Generation & Transmission 15 April 2013

» Natural Gas Pipelines 6 November 2012

Endnotes

1 Our cash flow analysis consists of three primary measures, including: cash flow from operations (CFO), funds from operations (FFO) and CFO before changes in working capital. For purposes of this report we reference FFO due to our forecast scenarios' focus on Net Income, Depreciation and Deferred Taxes (including regulatory liabilities associated with deferred taxes).

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Georgia Power Company

For Georgia Power, state regulators' approval of tax reform settlement is credit positive

From Credit Outlook

Last Monday, the Georgia Public Service Commission (GPSC) approved a 6 March tax reform settlement agreement between Georgia Power Company (A3 negative) and the GPSC staff. The settlement agreement addresses the effects of US tax reform legislation enacted at the end of last year, outlining customer refunds because of the lower tax rate as well as the treatment of deferred liabilities associated with Georgia Power's excess accumulated deferred income taxes.

Importantly, the agreement allows Georgia Power to increase its authorized retail equity ratio, which is currently around 51%, to the lower of the utility's actual common equity layer or 55%, until its next rate case filing, a credit positive. Georgia Power's settlement agreement and the increased authorized equity ratio also signal the continued credit-supportive regulatory environment in Georgia and the constructive relationship the utility has with the GPSC.

The tax reform legislation is overall credit negative for US regulated utilities because the lower 21% statutory tax rate reduces cash collected from customers, while the loss of bonus depreciation reduces tax deferrals, all else being equal. As a result, many utilities face a revenue reduction stemming from potential customer refunds and have been working with their state regulators to pursue regulatory offsets to mitigate the negative cash flow, including changes to their authorized equity layer.

Under Georgia Power's settlement agreement, the utility will issue customer refunds totaling $330 million, including $131 million in October 2018, $96 million in June 2019 and $103 million in February 2020. Furthermore, Georgia Power will defer as a regulatory liability a reduction in revenue related to the lower state tax rate in Georgia, as well as the full benefit of approximately $700 million in federal and state excess accumulated deferred income taxes. The amortization of these regulatory liabilities is likely to be addressed in the utility's next base rate case, which is currently scheduled to be filed by 1 July 2019. In the event that there is no rate case filing in 2019, Georgia Power's customers will be given an additional $185 million in annual bill credits, with any incremental federal income tax savings deferred as a regulatory liability until the next eventual rate case.

Georgia Power is a regulated vertically integrated utility and the largest subsidiary of The Southern Company (Baa2 negative), providing electricity to retail customers in Georgia and to wholesale customers in the Southeast. Georgia Power serves more than 2.4 million customers and has approximately 15,274 megawatts of generating capacity.

REPORT NUMBER 1119984

This publication does not announce a credit rating action. For any credit ratings referenced in this publication, please see the ratings tab on the issuer/entity page on www.moodys.com for the most updated credit rating action information and rating history.

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CREDIT OPINION
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Update

Rate this Research

RATINGS

Alabama Power Company

Domicile	Birmingham, Alabama, United States
Long Term Rating	A1
Type	LT Issuer Rating
Outlook	Stable

Please see the ratings section at the end of this report for more information. The ratings and outlook shown reflect information as of the publication date.

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Alabama Power Company

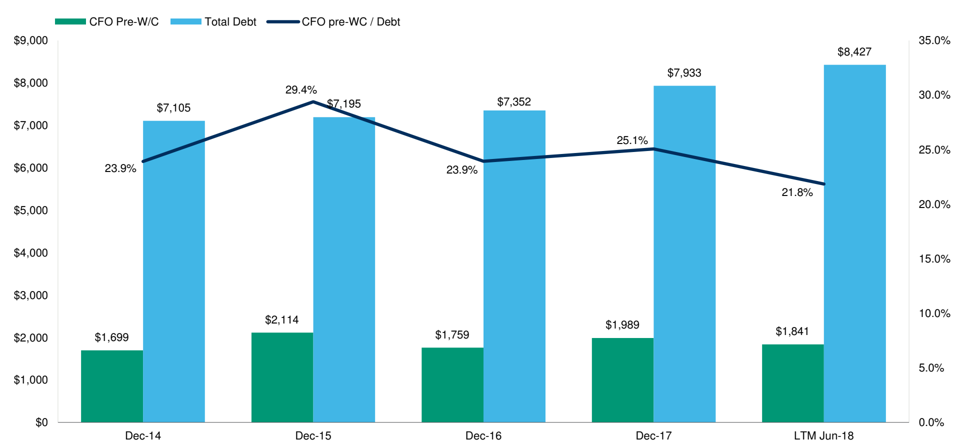
Update following affirmation of rating, stable outlook

Summary

Alabama Power's credit profile reflects the utility's credit supportive regulatory environment in Alabama, its timely cost recovery provisions, and a solid financial profile that is well positioned for its credit quality. Our view of Alabama Power's credit also considers the utility's comparatively low risk business profile as one of the few major vertically integrated electric utilities in the Southeast without the need for significant new baseload generation over the next several years, although it is adding some renewables.

However, Alabama Power does have elevated carbon transition risk within the regulated utility sector because its fuel mix is heavily dependent on coal and natural gas although it also includes some nuclear and hydro capacity, and the company will be adding a modest amount of renewable energy. We expect that capital expenditures (capex) will remain high over the next few years, mostly due to transmission and distribution investment and generation system maintenance. Factoring in the negative impacts from changes in the US tax law, somewhat offset by the benefits associated with a gradual increase in its equity ratio approved by state regulators, Alabama Power's financial metrics will remain stable albeit below historical levels, such that its ratio of cash flow pre-working capital (CFO pre-W/C) to debt will be in the low-to-mid 20% range.

Exhibit 1
Historical CFO pre-W/C, Total Debt and ratio of CFO pre-W/C to Debt ($ in millions)



Source: Moody's Financial Metrics

Credit strengths

» Credit supportive regulatory environment

» Cost recovery mechanisms provide timely recovery of prudent costs and investments

» Relatively low business and operating risk profile compared to other large vertically integrated electric utilities because of the lack of need for substantial baseload generation in the near term

» Financial metrics expected to remain stable and supportive of current credit quality

Credit challenges

» Recent changes in tax reform legislation, although somewhat offset by a gradual increase in its equity ratio, will negatively impact cash flow

» Capital expenditures to remain elevated mostly due to spending related to transmission & distribution investments and generation maintenance with significant amount of coal and natural gas-fired generation

Rating outlook

The stable rating outlook incorporates our expectation that the Alabama regulatory environment will continue to remain credit supportive with timely cost recovery mechanisms, and that the company will effectively manage its elevated capex and maintain stable financial metrics including a ratio of CFO pre-W/C to debt in the low-to-mid 20% range, albeit weak for the credit profile.

Factors that could lead to an upgrade

An upgrade could be considered if the regulatory framework in Alabama remains credit supportive and there is a sustained improvement in key financial ratios closer to our parameters for a Aa rating, including a ratio of CFO pre-W/C to debt above 30%.

Factors that could lead to a downgrade

Ratings could be downgraded if there is an adverse change in the regulatory framework for utilities in Alabama, if there is a substantial increase in environmental or other costs that are not recoverable, if the parent Southern Company is downgraded, or if the company's financial metrics deteriorate for an extended period, including a ratio of CFO pre-W/C to debt in the low 20% range.

Key indicators

Exhibit 2

Alabama Power Company [1]

	Dec-14	Dec-15	Dec-16	Dec-17	LTM Jun-18
CFO pre-WC + Interest / Interest	6.8x	7.8x	6.6x	7.3x	6.7x
CFO pre-WC / Debt	23.9%	29.4%	23.9%	25.1%	21.8%
CFO pre-WC – Dividends / Debt	15.8%	21.5%	13.6%	16.1%	12.9%
Debt / Capitalization	41.5%	40.8%	39.6%	44.6%	44.6%

[1] All ratios are based on 'Adjusted' financial data and incorporate Moody's Global Standard Adjustments for Non-Financial Corporations.
Source: Moody's Financial Metrics

Profile

Alabama Power Company is a vertically integrated utility subsidiary of The Southern Company (Baa2 stable), providing electricity to retail customers within the state of Alabama and to wholesale customers throughout the Southeast. Alabama Power serves almost 1.5 million customers across a 44,500 square mile service territory, owns approximately 11,797 MW of generating capacity, and operates within the Southern Company power pool.

Detailed credit considerations

CREDIT SUPPORTIVE REGULATORY ENVIRONMENT WITH SEVERAL TIMELY RATE RECOVERY MECHANISMS

Alabama Power operates in a credit supportive regulatory environment under an Alabama Public Service Commission (APSC) approved Rate Stabilization and Equalization (Rate RSE) plan. The Rate RSE provides for periodic annual revenue adjustments based on the utility's projected weighted cost of equity return (WCER). On 1 May 2018, in response to changes to US tax legislation, the APSC approved modifications to the Rate RSE and made other commitments designed to support the credit quality of Alabama Power. The WCER range was adjusted by reducing the high end of the range to 6.15% from 6.21% with the low end of the range remaining at 5.75%, with an adjusting mid-point of 5.95%. The company can earn an additional 7 basis points if it maintains an A credit rating from one rating agency or is in the top third of a customer value (or service quality) benchmark that the APSC staff utilizes.

As part of the Rate RSE modifications in May 2018, the APSC also approved an increase in Alabama Power's equity ratio to 55% by 2025, a credit positive. The Rate RSE adjustments are based on forward-looking information for the applicable upcoming calendar year and also adjust the refund mechanism applicable to prior year actual results, which allows Alabama Power to retain a portion of the revenue that causes the actual WCER for a given year to exceed the allowed range. Rate RSE adjustments for any two-year period, when averaged together, cannot exceed 4.0% and any annual adjustments are limited to 5.0%.

As a result of the change in the federal income tax rate under the tax reform legislation, Alabama Power will also return approximately $257 million to retail customers through bill credits in the second half of 2018. Additionally, Alabama Power will return $50 million to customers through bill credits in 2019. The APSC also approved an accounting order that authorizes Alabama Power to defer the benefits of excess deferred income taxes associated with changes in the tax legislation for 2018 as a regulatory liability. Up to $30 million of these tax deferrals can be used to offset under-recovered fuel costs. In conjunction with these modifications to Rate RSE, Alabama Power committed to a moratorium on any upward adjustments under Rate RSE for 2019 and 2020, a credit negative.

Prior to the passage of the tax legislation, on 1 December 2017, Alabama Power made its annual Rate RSE submission of projected data for 2018 to the APSC. Since projected earnings were within the specified range, retail rates under Rate RSE remained unchanged for 2018. Alabama Power utilizes a Rate Certified New Plant (Rate CNP) mechanism for recovery of capital and operating costs related to commercial operation of certified generation assets, recovery of the costs (excluding fuel) associated with certified purchased power agreements, and recovery of costs associated with governmental mandates. As of 30 June 2018, the deferred under recovery balance of Rate CNP was $41 million.

The company also utilizes an Energy Cost Recovery (ECR) mechanism which allows for timely recovery of fuel costs, purchased power costs and can result in an over or under-accrued balance. As of 30 June 2018, the under-recovered fuel cost balance was $80 million.

Alabama Power maintains a Natural Disaster Reserve (NDR) for operations and maintenance expenses to cover the cost of damages to its transmission and distribution facilities from major storms, based on an APSC order. The APSC also allows for reliability-related expenditures to be charged against the NDR when the balance exceeds $75 million. As of 31 December 2017, the balance was $38 million and because it was below $50 million, the NDR charge was activated. As such, Alabama Power will collect $15 million annually until the balance is restored to $75 million.

RELATIVELY LOW BUSINESS AND OPERATING RISK PROFILE WITH LACK OF NEED FOR NEW BASELOAD GENERATION OVER THE NEAR TERM

Alabama Power's 11,797 MW of generation capacity supports its maximum peak demand over the last five years of 12,162 MW, in addition to some purchased power that provided about 9.5% of its energy in 2017. The utility operates under an Intercompany Interchange Contract (IIC) with other Southern Company affiliates and benefits from the larger Southern Company power pool for flexibility in meeting its load requirements. Unlike several other major utilities in the southeast region, Alabama Power has no need to construct significant new base load generation over the next several years. Alabama Power is adding a modest amount of renewable energy to its generation mix following the 2015 APSC approval of the utility's petition for a Renewable Generation Certificate of up to 500 MWs over a six-year period. This allows the utility to build its own renewable projects of up 80 MWs each, or to purchase power from other renewable sources. The utility has thus far entered into agreements to purchase power from and to build 89 MWs of renewable generation.

CAPITAL SPENDING LEVELS REMAIN ELEVATED RELATED TO TRANSMISSION AND DISTRIBUTION INVESTMENT AND GENERATION MAINTENANCE

Alabama Power's planned capital expenditures are materially higher than in prior years, which is largely driven by transmission and distribution investments and generation maintenance, and higher general capital expenditures. From 2018 through 2021, the company expects to invest a total of $7.1 billion including $2.2 billion in 2018, $1.6 billion in 2019, $1.6 billion in 2020, and $1.7 billion in 2021. The $1.8 billion average annual spend over the next four years is consistent with the $2 billion of investments made in 2017 but substantially higher than the annual average of $1.3 billion over the five year period from 2012 through 2016.

Investments to comply with environmental statutes and regulations included in these estimates will fall from $0.6 billion in 2018 to $0.1 billion in 2019, $0.2 billion in 2020, and $0.3 billion in 2021. These capital expenditures do not include any potential compliance costs that may arise from the EPA's final rules and guidelines or subsequently approved state plans that would limit carbon emissions from fossil fuel generation.

The company also expects costs associated with closure-in-place and monitoring of ash ponds in accordance with the Coal Combustion Residuals (CCR) Rule, which are associated with the utility's asset retirement obligations. These are estimated to be $0.3 million in 2018, $232 million in 2019, $238 million in 2020, $246 million in 2021, and $252 million in 2022.

FINANCIAL METRICS ARE EXPECTED TO REMAIN STABLE AND SUPPORT ITS CURRENT CREDIT QUALITY

Alabama Power's ratio of CFO pre-W/C to debt ratio has been strong but somewhat variable in recent years, at about 24% in 2016 and 25% in 2017, down from 29.4% exhibited in 2015.

Going forward, we expect Alabama Power's financial metrics will be impacted by recent changes to US tax legislation but this will be partially offset by a May 2018 APSC order that addresses the impacts of this legislation, including approval for the company to increase its equity ratio to 55% by 2025. As such, we expect the company's financial metrics to be slightly lower over the next few years including a ratio of CFO pre-W/C to debt in the low-to-mid 20% range, at the low end of the A scoring range of 22% to 30% under the standard grid in our rating methodology for regulated electric and gas utilities.

RELATIVELY WIDE DIFFERENTIAL BETWEEN ALABAMA POWER AND PARENT SOUTHERN COMPANY CREDIT PROFILES

Alabama Power's credit quality is significantly stronger than its parent Southern Company's credit quality, in part due to structural subordination of its parent's debt obligations, the parent's weaker financial profile, relatively high parent level debt as a proportion of consolidated debt in the high 20% range, as well Southern's exposure to the Vogtle nuclear construction project at subsidiary, Georgia Power Company (Baa1 stable).

Alabama Power received capital contributions from Southern Company that aggregated $361 million in 2017 and $488 million during the first six months of 2018, making it somewhat reliant on a parent with materially lower credit quality. However, Alabama Power maintains its own bank credit facilities and commercial paper program and the Southern Company system does not utilize a money pool or other common borrowing arrangement. As a result, Alabama Power has thus far been for the most part little affected by the credit issues facing the parent and some of its affiliate utilities. However, material additional pressure on the Southern parent company credit profile could also in turn, negatively affect the credit quality of Alabama Power.

ELEVATED CARBON TRANSITION RISK

Alabama Power has an elevated carbon transition risk within the regulated utility sector as its significant coal generation ownership results in a higher risk profile than other utilities. Currently, we estimate about 50% of its energy supplied is generated by coal. Since 2015, Alabama Power has retired 3 coal-fired generating units which totaled 425 MW of ownership. However, given the substantial capital investments expected to meet environmental mandates and no renewable portfolio standards requirements in the state, we do not expect a meaningful reduction in fossil fuel fired generation in the near term.

We believe regulated utilities like Alabama Power will fare better than unregulated coal generators in meeting environmental compliance obligations, with the company's current credit quality incorporating our expectation that it will continue to recover its environmental expenditures in rates, although there could be some regulatory lag. Alabama Power has also announced the retirement and/or the conversion of several coal units to natural gas, which will help mitigate the impact of any new environmental compliance obligations and reduce carbon transition risk. Moody's framework for assessing carbon transition risk in this industry is set out in "Prudent regulation key to mitigating risk, capturing opportunities of decarbonization" (2 Nov 2017).

Liquidity analysis

Alabama Power's liquidity is supported by $1.333 billion of bank credit facilities supporting a $600 million commercial paper program of its own and a $1.14 billion commercial paper program at Southern Company Funding Corporation, a Southern Company subsidiary that issues commercial paper for its utility subsidiaries. In recent years, Alabama Power has for the most part utilized its own commercial paper program. While Alabama Power did not have any commercial paper outstanding at 30 June 2018, there was an average of $44 million and a maximum of $245 million outstanding during the three-month period ending 30 June 2018.

Alabama Power's liquidity is somewhat constrained as a substantial portion of its bank facilities also provides liquidity support for outstanding variable rate pollution control revenue bonds. As of 30 June 2018, the company had approximately $854 million of variable rate pollution control bonds backed by these credit facilities, as well as $120 million of fixed rate pollution control revenue bonds outstanding that are required to be remarketed in twelve months. Of the company's credit facilities, $2 million expires in 2018, $31 million in 2019, $500 million in 2020, and $800 million in 2022. There are no material adverse change clauses in any of Alabama Power's credit agreements and some include a 65% debt to capital financial maintenance covenant, which the company was in compliance with as of 30 June 2018.

Alabama Power maintains contracts for physical electricity purchases, fuel purchases, fuel transportation and storage and energy price risk management that could require collateral in the event of a ratings downgrade. If the utility's credit rating is downgraded below investment grade, the utility's potential collateral requirement would be $279 million. Generally, collateral could be provided by a Southern Company guaranty, letter of credit, or cash.

As of 30 June 2018, Alabama Power had $686 million of cash on hand compared to $544 million at 31 December 2017. Alabama Power has $200 million of debt maturities over the 12 months ending 30 June 2019.

Rating methodology and scorecard factors

Exhibit 3

Rating Factors				
Alabama Power Company				
Regulated Electric and Gas Utilities Industry Grid [1][2]	Current LTM 6/30/2018		Moody's 12-18 Month Forward View As of Date Published [3]	
Factor 1 : Regulatory Framework (25%)	**Measure**	**Score**	**Measure**	**Score**
a) Legislative and Judicial Underpinnings of the Regulatory Framework	A	A	A	A
b) Consistency and Predictability of Regulation	Aa	Aa	Aa	Aa
Factor 2 : Ability to Recover Costs and Earn Returns (25%)				
a) Timeliness of Recovery of Operating and Capital Costs	Aa	Aa	Aa	Aa
b) Sufficiency of Rates and Returns	Aa	Aa	Aa	Aa
Factor 3 : Diversification (10%)				
a) Market Position	Baa	Baa	Baa	Baa
b) Generation and Fuel Diversity	Baa	Baa	Baa	Baa
Factor 4 : Financial Strength (40%) [4]				
a) CFO pre-WC + Interest / Interest (3 Year Avg)	7.2x	Aa	6x - 7x	Aa
b) CFO pre-WC / Debt (3 Year Avg)	25.0%	A	22% - 25%	A
c) CFO pre-WC – Dividends / Debt (3 Year Avg)	15.8%	Baa	12% - 15%	Baa
d) Debt / Capitalization (3 Year Avg)	41.6%	A	39% - 42%	A
Rating:				
Grid-Indicated Rating Before Notching Adjustment		A1		A2
HoldCo Structural Subordination Notching				
a) Indicated Rating from Grid		A1		A2
b) Actual Rating Assigned		A1		A1

[1] All ratios are based on 'Adjusted' financial data and incorporate Moody's Global Standard Adjustments for Non-Financial Corporations.
[2] As of 6/30/2018(L)
[3] This represents Moody's forward view; not the view of the issuer; and unless noted in the text, does not incorporate significant acquisitions and divestitures.
[4] Standard grid for financial risk.
Source: Moody's Financial Metrics

Appendix

Exhibit 4

Peer Comparison [1]

	Alabama Power Company A1 stable			Georgia Power Company Baa1 stable			Florida Power & Light Company A1 Stable			Duke Energy Carolinas, LLC A1 Stable		
(in US millions)	FYE Dec-16	FYE Dec-17	LTM Jun-18	FYE Dec-16	FYE Dec-17	LTM Jun-18	FYE Dec-15	FYE Dec-16	LTM Jul-18	FYE Dec-16	FYE Dec-17	LTM Jul-18
Revenue	$5,889	$6,039	$6,149	$8,383	$8,310	$8,439	$11,651	$10,895	$11,882	$7,322	$7,302	$7,292
EBITDA	$2,488	$2,598	$2,573	$3,544	$3,723	$3,739	$4,742	$5,011	$4,544	$3,630	$3,703	$3,641
CFO pre-WC / Debt	23.9%	25.1%	21.8%	21.1%	20.2%	24.0%	36.8%	42.0%	36.9%	29.5%	27.2%	25.1%
CFO pre-WC – Dividends / Debt	13.6%	16.1%	12.9%	9.8%	9.7%	11.9%	30.0%	29.8%	29.1%	9.3%	21.2%	18.5%
Debt / EBITDA	3.0x	3.1x	3.3x	3.2x	3.3x	3.0x	2.2x	2.1x	3.0x	2.7x	2.8x	3.1x
Debt / Capitalization	39.6%	44.6%	44.6%	39.7%	44.7%	41.5%	30.8%	29.8%	36.1%	36.4%	41.6%	43.7%
EBITDA / Interest Expense	7.9x	8.2x	7.9x	8.6x	8.3x	8.4x	10.7x	11.0x	8.8x	7.7x	7.8x	7.5x

[1] All figures and ratios are calculated using Moody's estimates and standard adjustments. Periods are Financial Year-End unless indicated. LTM = Last Twelve Months
Source: Moody's Financial Metrics

Exhibit 5

Cash Flow and Credit Metrics [1]

CF Metrics	Dec-14	Dec-15	Dec-16	Dec-17	LTM Jun-18
As Adjusted					
FFO	**1,694**	**1,923**	**1,838**	**2,125**	**1,996**
+/- Other	5	191	(79)	(136)	(155)
CFO Pre-WC	1,699	2,114	1,759	1,989	1,841
+/- ΔWC	(8)	17	285	(135)	(6)
CFO	**1,691**	**2,131**	**2,044**	**1,854**	**1,835**
- Div	573	566	761	710	755
- Capex	1,532	1,432	1,381	2,015	2,254
FCF	**(414)**	**133**	**(98)**	**(871)**	**(1,175)**
(CFO Pre-W/C) / Debt	23.9%	29.4%	23.9%	25.1%	21.8%
(CFO Pre-W/C - Dividends) / Debt	15.8%	21.5%	13.6%	16.1%	12.9%
FFO / Debt	23.8%	26.7%	25.0%	26.8%	23.7%
RCF / Debt	15.8%	18.9%	14.7%	17.8%	14.7%

[1] All figures & ratios calculated using Moody's estimates & standard adjustments. FYE = Financial Year-End. LTM = Last Twelve Months.
Source: Moody's Financial Metrics

Ratings

Exhibit 6

Category	Moody's Rating
ALABAMA POWER COMPANY	
Outlook	Stable
Issuer Rating	A1
Sr Unsec Bank Credit Facility	A1
Senior Unsecured	A1
Pref. Stock	A3
Commercial Paper	P-1
PARENT: SOUTHERN COMPANY (THE)	
Outlook	Stable
Sr Unsec Bank Credit Facility	Baa2
Senior Unsecured	Baa2
Jr Subordinate	Baa3
Commercial Paper	P-2
ALABAMA POWER CAPITAL TRUST V	
Outlook	Stable
BACKED Pref. Stock	A2
SOUTHERN ELECT GENERATING CO	
Outlook	Stable
Issuer Rating	A2
Bkd Senior Unsecured	A1

Source: Moody's Investors Service

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29 November 2018

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Moving to 2021 for Valuation and Updating our Outlook

We are rolling forward our methodology to 2021 price to earnings as a basis for valuation. We refreshed our EPS forecasts and updated the UBS Regulatory Rankings for 2018 data. Regulated Utilities stand within a standard deviation of fair value on key relative yield and P/E metrics. Therefore we expect investors to capture a total return of approximately 9%. This consists of an average dividend yield of 3.5% and a return for growth of 5.3% (the average of 5.4% 5 year EPS CAGR and 5.2% dividend growth CAGR). *This version updates Figure 1 to show the current price target for EXC as $51 and for H as $18.*

Raising D and EMA to Buy from Neutral; Lowering AEE to Neutral

We believe D has taken the appropriate actions to overcome the surprise MLP tax ruling by FERC earlier this year and the likelihood of closing the merger with SCG has increased. Our sum of the parts price target goes to $84 from $75. Other ratings changes driven by valuation include AEE to Neutral from Buy while maintaining our $71 price target and CUP to Neutral from Sell with a $1 increase in the price target to $13. We are also upgrading EMA to Buy from Neutral and increasing our PT to C$51 from C$42 as we believe the asset sale process that started with the New England Generation sale on Monday will address the balance sheet and valuation overhang.

Recommendations and Focus Stocks

Our recommendations fall into 4 categories: higher quality total return compounders; higher growth multi-utilities; special situations; and integrated power. Our top choices in each category are ETR, D, FE, and PEG.

Sell Recommendations: POR, PNM, HE and H

We lowered our price target on POR by $1 to $44. POR is a 4th quartile growing utility with -5% total return to our target. We remain cautious on HE at the current valuation while the commission establishes the framework for Performance-Based Ratemaking. The process will be ongoing through 2019. HE and PNM operate in states that fall in the lowest tier of our Regulatory Rankings. We are lowering our H target by C$1 to C$18 and believe that the AVA merger will close by 1Q'19 despite being dilutive. Even post potential AVA merger close, H will predominately operate in Ontario which we rank at the bottom of Tier 4 as a regulatory jurisdiction.

Figure 1: Regulated Utility Price Target Changes

			Price Target Old			Price Target New									
Rating	Ticker	Company	UBS 2020E EPS	2020 P/E Ratio	Old UBS Price Target	UBS 2021E EPS	2021 P/E Ratio	% Discount	New UBS Price Target	Current Dividend Yield	Total Return inc. Div. Yld	5 Yr EPS Growth	5 Yr DPS Growth	Regulatory Quartile	Old Regulatory Quartile
Buy	ACO	ATCO Ltd. (CS)	$3.38	11.7x	$47	$3.34	11.8x	(28%)	$49	3.8%	28%	3.6%	5.2%	4th	4th
Buy	EMA	Emera Inc (CS)	$3.05	14.2x	$42	$3.26	13.3x	(19%)	$51	5.4%	23%	6.2%	5.9%	2nd	2nd
Buy	NEE	NextEra Energy	$9.08	19.6x	$195	$9.84	18.1x	10%	$209	2.5%	20%	9.5%	12.0%	1st	1st
Buy	PEG	Public Service Ent Group	$3.66	14.8x	$60	$3.77	14.4x	(12%)	$63	3.3%	19%	6.6%	4.9%	2nd	2nd
Buy	FE	FirstEnergy Corp	$2.46	15.4x	$43	$2.60	14.6x	(11%)	$43	4.0%	19%	3.0%	3.5%	2nd	2nd
Buy	FTS	Fortis Inc (CS)	$2.84	16.2x	$49	$3.01	15.3x	(7%)	$53	3.9%	19%	4.8%	6.4%	3rd	2nd
Buy	ETR	Entergy Corp	$5.40	16.0x	$94	$5.73	15.1x	(8%)	$99	4.2%	18%	5.5%	2.0%	2nd	3rd
Buy	D	Dominion Energy	$4.35	17.0x	$75	$4.71	15.7x	(4%)	$84	4.5%	18%	6.7%	6.0%	1st	1st
Buy	SRE	Sempra Energy	$6.99	16.1x	$130	$7.55	14.9x	(9%)	$129	3.2%	18%	8.0%	9.0%	3rd	3rd
Buy	DUK	Duke Energy	$5.29	16.6x	$92	$5.59	15.7x	(4%)	$99	4.2%	17%	5.2%	4.0%	1st	1st
Buy	PPL	PPL Corporation	$2.56	12.1x	$34	$2.59	12.0x	(27%)	$34	5.3%	15%	3.3%	3.3%	1st	2nd
Buy	EXC	Exelon	$3.16	14.4x	$50	$3.25	14.0x	(14%)	$51	3.0%	15%	5.9%	5.3%	3rd	2nd
Buy	AEP	American Electric Power	$4.46	17.2x	$83	$4.77	16.0x	(2%)	$85	3.5%	15%	6.0%	6.6%	2nd	2nd
Buy	ES	Eversource Energy	$3.72	18.2x	$69	$3.95	17.1x	4%	$75	3.0%	14%	6.1%	6.0%	3rd	3rd
Neutral	CUP	Caribbean Utilities Corp Ltd	$0.83	14.8x	$12	$0.89	13.9x	(15%)	$13	5.7%	13%	6.6%	5.7%	2nd	2nd
Neutral	CU	Canadian Utilities Ltd (CS)	$2.35	13.2x	$33	$2.31	13.5x	(18%)	$33	5.1%	12%	1.6%	5.9%	4th	4th
Neutral	ED	Consolidated Edison	$4.60	17.2x	$80	$4.93	16.0x	(2%)	$85	3.6%	11%	4.6%	3.0%	4th	4th
Neutral	SO	Southern Company	$3.17	14.5x	$49	$3.30	13.9x	(15%)	$49	5.2%	11%	3.2%	3.5%	1st	1st
Neutral	CMS	CMS Energy	$2.73	18.7x	$54	$2.92	17.5x	7%	$55	2.8%	10%	7.7%	7.0%	1st	1st
Neutral	LNT	Alliant Energy	$2.45	18.3x	$46	$2.54	17.6x	8%	$48	3.0%	10%	7.1%	6.1%	1st	2nd
Neutral	SCG	SCANA Corp	$2.90	16.2x	$41	$2.66	17.7x	8%	$50	1.1%	7%	-8.0%	6.5%	3rd	1st
Neutral	DTE	DTE Energy	$6.62	17.8x	$118	$7.01	16.8x	2%	$121	3.0%	6%	6.1%	6.6%	1st	1st
Neutral	PNW	Pinnacle West Capital Corp	$5.28	17.0x	$90	$5.52	16.3x	(1%)	$92	3.3%	6%	5.6%	6.0%	4th	3rd
Neutral	WEC	WEC Energy Group	$3.74	19.0x	$70	$3.97	17.9x	9%	$73	3.1%	6%	6.0%	6.3%	1st	1st
Neutral	AEE	Ameren Corp	$3.50	19.6x	$71	$3.85	17.8x	9%	$71	2.8%	6%	7.4%	6.0%	2nd	2nd
Neutral	AES	AES Corp.	$1.45	10.5x	$16	$1.61	9.5x	(42%)	$16	3.4%	5%	9.4%	6.5%	2nd	2nd
Neutral	OGE	OGE Energy Corp	$2.30	17.1x	$37	$2.39	16.5x	0%	$40	3.7%	5%	4.9%	8.9%	4th	4th
Neutral	XEL	Xcel Energy	$2.77	18.7x	$50	$2.95	17.5x	7%	$53	2.9%	5%	6.1%	6.0%	2nd	2nd
Neutral	EVRG	Evergy	$3.38	17.7x	$58	$3.44	17.4x	6%	$61	3.1%	5%	8.3%	7.8%	3rd	3rd
Neutral (CBE)	EIX	Edison International	$4.87	11.4x	$55	$5.19	10.7x	(35%)	$55	4.4%	4%	4.4%	0.0%	3rd	3rd
Sell	H	Hydro One Ltd (CS)	$1.34	14.5x	$19	$1.41	13.8x	(16%)	$18	4.7%	(3%)	4.8%	7.1%	4th	4th
Neutral (CBE)	PCG	PG&E Corp	$4.24	6.4x	$26	$4.41	6.1x	(63%)	$26	0.0%	(4%)	4.4%	0.0%	3rd	3rd
Sell	POR	Portland General	$2.64	18.2x	$45	$2.65	18.1x	11%	$44	3.0%	(5%)	3.6%	6.4%	2nd	3rd
Sell	PNM	PNM Resources	$2.19	19.5x	$37	$2.29	18.6x	14%	$39	2.5%	(7%)	4.3%	6.0%	4th	4th
Sell	HE	Hawaiian Electric Industries	$2.20	17.3x	$33	$2.19	17.3x	6%	$33	3.3%	(9%)	6.7%	0.0%	4th	4th
Overall Average (unnormalized, inc. Gas Midstream)				**16.5x**			**15.6x**								
Electric Utility Normalized (including Gas Midstream) (a)				**17.4x**			**16.4x**								

(a) Normalized multiple excludes AES, EIX, EXC, PCG, PEG, PPL, SCG and SO.

Source: Company reports, UBS estimates, FactSet

Rolling On to 2021 for Valuation

We updated our price targets and the underlying drivers for valuation incorporating 2021 as a basis for P/E. To determine the valuation multiple we assign to stocks we consider: the sector valuation, EPS growth, weighted average regulatory ranking, and unregulated business contributions. For sector valuation we consider relative yield to the Baa corporate bond in a series back to 1981 and for relative P/E we look at valuation back to 2008. Currently, the group is within a standard deviation of fair value using both measures. Using relative yield Regulated Utilities are +6% beyond the mean within a 7% standard deviation and +7% using relative P/E within a 10% standard deviation. Therefore, we expect one year total return for the group to approximate 9% including a 3.5% dividend yield and a 5.3% growth return (the average of a 5.4% 5 year EPS CAGR and a 5.2% 5 year dividend growth CAGR). However, our forecast for earnings leaves the group offering 5% return over the year.

With regard to EPS growth and quality of regulation we rank the companies in quartiles. Based on historical stock performance we assign +5% for top quartile, +2% for second quartile, -2% for third quartile and -5% for fourth quartile which are summarized below. For companies with significant unregulated businesses we value them on a sum of the parts basis. We also allow for special situation company specific adjustments.

Figure 2: Regulated Valuation Methodology Matrix

Investment Opinion	Ticker	Overall Reg Group Premium Discount	Regulatory Quartile Premium Discount	Regulated EPS Growth Premium Discount	ESG Premium	Specific Adjustments	Net Prem Disc. Reg. Valuation	Business Value
Neutral	AES	5%	2%	5%	0%	(5%)	7%	$9
Buy	ACO	10%	(5%)	(5%)	0%	(5%)	(5%)	$5
Neutral	LNT	5%	5%	5%	0%	0%	15%	$0
Neutral	AEE	5%	2%	5%	0%	0%	12%	$0
Buy	AEP	5%	2%	2%	0%	0%	9%	$0
Neutral	CU	10%	(5%)	(5%)	0%	(10%)	(10%)	$0
Neutral	CUP	0%	2%	2%	0%	(10%)	(6%)	$0
Neutral	CMS	5%	5%	5%	0%	0%	15%	$0
Neutral	ED	5%	(5%)	(2%)	8%	0%	6%	$0
Buy	D	5%	5%	2%	0%	0%	12%	$40
Neutral	DTE	5%	5%	2%	0%	0%	12%	$30
Buy	DUK	5%	5%	(2%)	0%	0%	8%	$0
Neutral (CBE)	EIX	5%	(2%)	(2%)	0%	(30%)	(29%)	$0
Buy	EMA	10%	2%	(2%)	0%	(5%)	5%	$1
Buy	ETR	5%	2%	(2%)	0%	0%	5%	$0
Buy	ES	5%	(2%)	2%	10%	0%	15%	$0
Neutral	EVRG	5%	(2%)	5%	0%	0%	8%	$0
Buy	EXC	5%	(2%)	5%	0%	0%	8%	$11
Buy	FE	5%	2%	(5%)	0%	0%	2%	$0
Buy	FTS	10%	(2%)	2%	0%	0%	10%	$0
Sell	HE	5%	(5%)	2%	0%	0%	2%	$8
Sell	H	10%	(5%)	(5%)	0%	(15%)	(15%)	$0
Buy	NEE	5%	5%	5%	0%	0%	15%	$95
Neutral	OGE	5%	(5%)	(2%)	0%	0%	(2%)	$10
Neutral (CBE)	PCG	5%	(2%)	(2%)	0%	(63%)	(62%)	$0
Neutral	PNW	5%	(5%)	2%	0%	0%	2%	$0
Sell	PNM	5%	(5%)	(5%)	0%	8%	3%	$0
Sell	POR	5%	2%	(5%)	0%	0%	2%	$0
Buy	PPL	5%	5%	(5%)	0%	0%	5%	$13
Buy	PEG	5%	2%	5%	0%	0%	12%	$11
Neutral	SCG	5%	(2%)	(5%)	0%	0%	(2%)	$0
Buy	SRE	5%	(2%)	(2%)	0%	0%	1%	$38
Neutral	SO	5%	5%	(5%)	0%	(15%)	(10%)	$0
Neutral	WEC	5%	5%	2%	0%	0%	12%	$0
Neutral	XEL	5%	2%	2%	0%	0%	9%	$0
Note: CUP is domiciled in Grand Cayman and should not move with US or CDN interest rates								

Source: FactSet, UBS Equity Research

Our Recommendations

Our focus on stock selection as we head toward the end of 2018 and into the new year is for Regulated Utilities at a value as the top quality has outperformed in 2018. As shown below, companies that delivered top quartile earnings growth outperformed the rest of the group year-to-date, offering 14% upside. Overall quality which is a ranking we are basing on the average of EPS growth and our UBS weighted average regulatory ranking also performed this year. Special events like California wildfires, major project construction and international drove the bottom quality.

Our recommendations by style are listed below. Our focus stocks by category are ETR for higher quality, total return compounders; D for higher growth multi utilities; FE for special situations; and PEG for integrated power.

Figure 3: Recommended Stocks

Rating	Ticker	Current Price	UBS Price Target	Total Return inc. Div. Yld	UBS 2018E EPS	UBS 2019E EPS	UBS 2020E EPS	UBS 2021E EPS	2020 P/E Ratio	2020 Prem/ Disc	Current Dividend Yield	5 Yr EPS Growth	5 Yr DPS Growth
Higher Quality Total Return Compounders													
Buy	EMA	$43.41	$51	23%	$2.85	$2.80	$3.10	$3.26	14.0x	(17%)	5.4%	6.2%	5.9%
Buy	FTS	$46.04	$53	19%	$2.52	$2.64	$2.83	$3.01	16.2x	(4%)	3.9%	4.8%	6.4%
Buy	ETR	$86.29	$99	18%	$4.70	$5.09	$5.40	$5.73	16.0x	(8%)	4.2%	5.5%	2.0%
Buy	DUK	$87.83	$99	17%	$4.74	$5.03	$5.33	$5.59	16.5x	(5%)	4.2%	5.2%	4.0%
Buy	AEP	$76.58	$85	15%	$3.93	$4.18	$4.46	$4.77	17.2x	(2%)	3.5%	6.0%	6.6%
Buy	ES	$67.45	$75	14%	$3.28	$3.48	$3.72	$3.95	18.2x	4%	3.0%	6.1%	6.0%
Buy	AWK	$92.11	$101	12%	$3.31	$3.57	$3.85	$4.17	23.9x	(3%)	2.0%	8.3%	10.0%
Higher Growth Mutli-Utilities													
Buy	NEE	$178.00	$209	20%	$7.77	$8.43	$9.08	$9.84	19.6x	13%	2.5%	9.5%	12.0%
Buy	D	$74.11	$84	18%	$4.10	$4.25	$4.46	$4.71	16.6x	(5%)	4.5%	6.7%	6.0%
Buy	SRE	$112.69	$129	18%	$5.46	$5.89	$6.99	$7.55	16.1x	(7%)	3.2%	8.0%	9.0%
Special Situation													
Buy	ACO	$39.53	$49	28%	$2.95	$3.13	$3.20	$3.34	12.4x	(27%)	3.8%	3.6%	5.2%
Buy	FE	$37.89	$43	19%	$2.55	$2.57	$2.46	$2.60	15.4x	(12%)	4.0%	3.0%	3.5%
Buy	PPL	$31.12	$34	15%	$2.34	$2.40	$2.56	$2.59	12.2x	(30%)	5.3%	3.3%	3.3%
Integrated Power													
Buy	PEG	$54.29	$63	19%	$3.08	$3.35	$3.69	$3.77	14.7x	(16%)	3.3%	6.6%	4.9%
Buy	EXC	$45.53	$51	15%	$3.14	$3.18	$3.14	$3.25	14.5x	(17%)	3.0%	5.9%	5.3%
Sells													
Sell	AWR	$67.82	$48	(28%)	$1.75	$1.93	$2.04	$2.15	33.2x	37%	1.6%	5.3%	6.0%
Sell	CWT	$46.30	$39	(14%)	$1.27	$1.45	$1.65	$1.76	28.0x	15%	1.6%	5.8%	5.0%
Sell	HE	$37.92	$33	(9%)	$1.86	$1.99	$2.12	$2.19	17.9x	3%	3.3%	6.7%	0.0%
Sell	PNM	$42.60	$39	(7%)	$1.97	$2.14	$2.19	$2.29	19.5x	12%	2.5%	4.3%	6.0%
Sell	POR	$47.99	$44	(5%)	$2.37	$2.48	$2.57	$2.65	18.7x	7%	3.0%	3.6%	6.4%
Sell	CTWS	$69.75	$66	(4%)	$2.17	$2.27	$2.48	$2.69	28.1x	16%	1.8%	5.8%	5.0%
Sell	H	$19.47	$18	(3%)	$1.27	$1.27	$1.35	$1.41	14.4x	(17%)	4.7%	4.8%	7.1%

Source: FactSet, UBS Estimates, Prices as of 11/27/18

Figure 4: 2018 Stock Performance by Measure

EPS Growth	3 Month	6 Month	YTD
1st	4.8%	11.8%	14.2%
2nd	4.5%	10.3%	-0.2%
3rd	-3.7%	1.1%	-4.2%
4th	4.7%	10.4%	2.0%
Regulation	**3 Month**	**6 Month**	**YTD**
1st	4.4%	11.6%	3.0%
2nd	4.1%	10.5%	8.5%
3rd	-2.8%	3.8%	-0.4%
4th	3.7%	6.4%	-2.3%
Quality	**3 Month**	**6 Month**	**YTD**
1st	3.3%	10.6%	7.1%
2nd	6.7%	12.6%	6.0%
3rd	3.0%	9.9%	5.2%
4th	-2.4%	1.3%	-6.4%

Source: FactSet, S&P Global Market Intelligence, UBS Equity Research

Earnings Growth

We updated our EPS estimates with the roll-forward in methodology and summarize our changes by company below. Our utility valuation methodology utilizes 5 year utility, parent and other EPS growth as an input. Top quartile growth begins at 7.1% while median growth is 5.8%. Investors are currently awarding a double digit premium for stocks that offer the highest growth.

Figure 5: Earnings Growth Quality Quartiles

Quality Quartile	Low Growth	High Growth	Current Growth	Current P/E Ratio	Current Prem/Disc
1st	7.10%		8.2%	18.2x	11.4%
2nd	5.80%	6.60%	6.3%	18.2x	10.9%
3rd	4.40%	5.60%	5.0%	15.8x	-3.5%
4th	0.00%	4.30%	1.5%	16.2x	-1.0%

Source: FactSet, S&P Global Market Intelligence, UBS Equity Research

Figure 6: Regulated Utility EPS Estimate Changes

Rating	Ticker	Company	UBS 2018E EPS	UBS 2019E EPS	UBS 2020E EPS	UBS 2021E EPS	UBS 2018E EPS Old	UBS 2019E EPS Old	UBS 2020E EPS Old	UBS 2021E EPS Old
Buy	ACO	ATCO Ltd. (C$)	$2.95	$3.13	$3.20	$3.34	$2.96	$3.29	$3.38	$3.54
Neutral	AEE	Ameren Corp	$3.40	$3.18	$3.48	$3.85	$3.40	$3.18	$3.50	$3.87
Neutral	CMS	CMS Energy	$2.33	$2.50	$2.70	$2.92	$2.33	$2.53	$2.73	$2.95
Neutral	CU	Canadian Utilities Ltd (C$)	$2.06	$2.15	$2.21	$2.31	$2.07	$2.27	$2.35	$2.46
Neutral	CUP	Caribbean Utilities Corp Ltd	$0.71	$0.77	$0.80	$0.89	$0.71	$0.78	$0.83	$0.94
Buy	D	Dominion Energy	$4.10	$4.25	$4.46	$4.71	$4.10	$4.16	$4.35	$4.58
Buy	DUK	Duke Energy	$4.74	$5.03	$5.33	$5.59	$4.74	$5.03	$5.29	$5.56
Buy	EMA	Emera Inc (C$)	$2.85	$2.80	$3.10	$3.26	$2.68	$2.91	$3.05	$3.21
Buy	ES	Eversource Energy	$3.28	$3.48	$3.72	$3.95	$3.28	$3.48	$3.72	$3.95
Buy	EXC	Exelon	$3.14	$3.18	$3.14	$3.25	$3.14	$3.19	$3.16	$3.29
Buy	FTS	Fortis Inc (C$)	$2.52	$2.64	$2.83	$3.01	$2.52	$2.65	$2.84	$3.01
Sell	HE	Hawaiian Electric Industries	$1.86	$1.99	$2.12	$2.19	$1.89	$2.05	$2.20	$2.29
Sell	H	Hydro One Ltd (C$)	$1.27	$1.27	$1.35	$1.41	$1.23	$1.32	$1.34	$1.51
Buy	NEE	NextEra Energy	$7.77	$8.43	$9.08	$9.84	$7.88	$8.41	$9.06	$9.74
Neutral	OGE	OGE Energy Corp	$2.07	$2.12	$2.31	$2.39	$2.08	$2.14	$2.30	$2.38
Sell	POR	Portland General	$2.37	$2.48	$2.57	$2.65	$2.37	$2.53	$2.64	$2.78
Buy	PPL	PPL Corporation	$2.34	$2.40	$2.56	$2.59	$2.33	$2.42	$2.56	$2.59
Buy	PEG	Public Service Ent Group	$3.08	$3.35	$3.69	$3.77	$3.08	$3.47	$3.66	$3.76
Neutral	SCG	SCANA Corp	$2.67	$2.30	$2.44	$2.66	$3.13	$2.76	$2.90	$3.12
Neutral	SO	Southern Company	$3.06	$3.04	$3.17	$3.30	$3.06	$3.04	$3.17	$3.30
Buy	SRE	Sempra Energy	$5.46	$5.89	$6.99	$7.55	$5.31	$5.89	$6.99	$7.55

Source: Company reports, UBS estimates, FactSet

Regulatory Ranking Refresh

We did a refresh of the UBS regulatory rankings to include 2018 rate cases, data updates on the average customer bill and rates, and to note other changes in regulation this year. The states with material moves (beyond 6 slots plus or minus) in the United States were Louisiana, Kansas, Massachusetts, and Oregon on the plus side and Nebraska, New Hampshire, New York, and South Carolina on the negative side. As a reminder our regulatory rankings consider 6 factors in a simple average: 1) Appointed or elected commissions; 2) Allowed return spread history, 3) Mechanisms that reduce regulatory lag; 4) Rates and customer levels compared to region; 5) Tendency to settle versus litigate rate cases; and 6) A subjective investor friendliness factor.

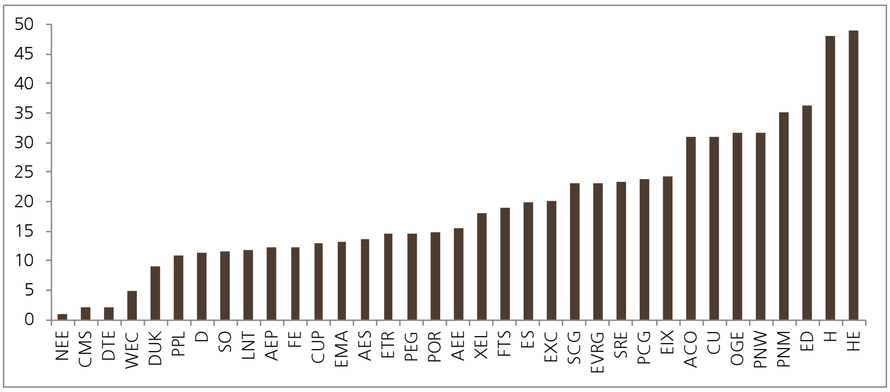
Figure 7: UBS Regulatory Rankings

TIER 1	TIER 2	TIER 3	TIER 4	TIER 5
		Nova Scotia		
		North Dakota		
FERC		Iowa		
		Kentucky		
		Washington		
		Tennessee		
		Texas		
		Missouri		
		Massachusetts		
		South Carolina		
	Pennsylvania	Wyoming	Prince Edward Island	
	Illinois	Kansas	Nevada	
	Arkansas	Rhode Island	New Hampshire	
	Ohio	California	New York	
Florida	Louisiana	Alberta	Oklahoma	New Mexico
Michigan	Georgia	Newfoundland & Labrador	Alaska	Maine
Utah	Idaho	Delaware	West Virginia	Maryland
Wisconsin	British Columbia	Minnesota	South Dakota	Montana
Alabama	Indiana	Connecticut	Nebraska	Hawaii
Colorado	Virginia	New Jersey	Mississippi	Vermont
North Carolina	Oregon	Arizona	Ontario	District of Columbia
JD Power Average Customer Service Scores				
727	722	707	624	695

Source: Canadian Provincial Regulatory Websites, S&P Global Market Intelligence, FactSet, JD Power, UBS Equity Research

Below we provide a weighted average regulatory ranking by company. We believe that constructive regulation is good for the customer and the shareholder. Our ranking of states is positively correlated to JD Power customer service scores.

Figure 8: Weighted Average Regulatory Ranking by Company



Source: FactSet, S&P Global Market Intelligence, UBS Equity Research

Companies with better weighted average regulatory rankings also have higher investment in the system and experience less regulatory lag which contributes to a premium valuation. Companies that had a positive move of 6 slots or more were PPL, AEE and ETR. SCG had a notably negative move.

Figure 9: Regulated Utility Quartiles

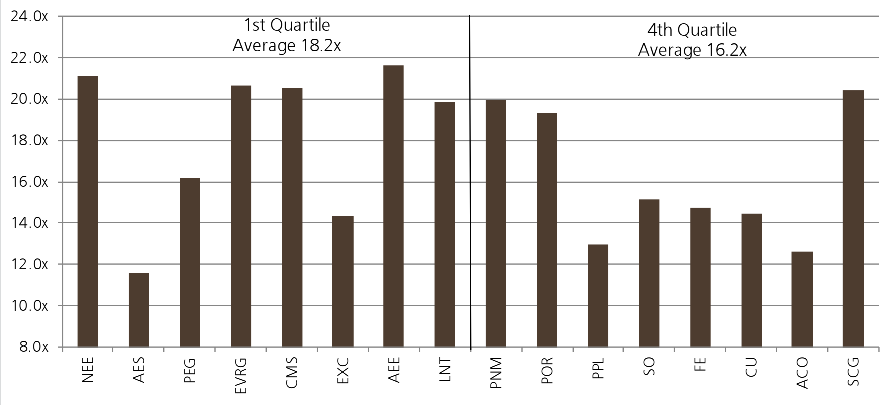
Metric	1st Quartile	2nd Quartile	3rd Quartile	4th Quartile
Ratebase Growth '17-'22	7.6%	6.4%	4.8%	2.7%
Price/Book	2.45x	2.40x	1.56x	1.72x
Earned ROE	11.5%	10.0%	9.8%	9.6%

Source: FactSet, S&P Global Market Intelligence, UBS Equity Research

Back Testing the Methodology

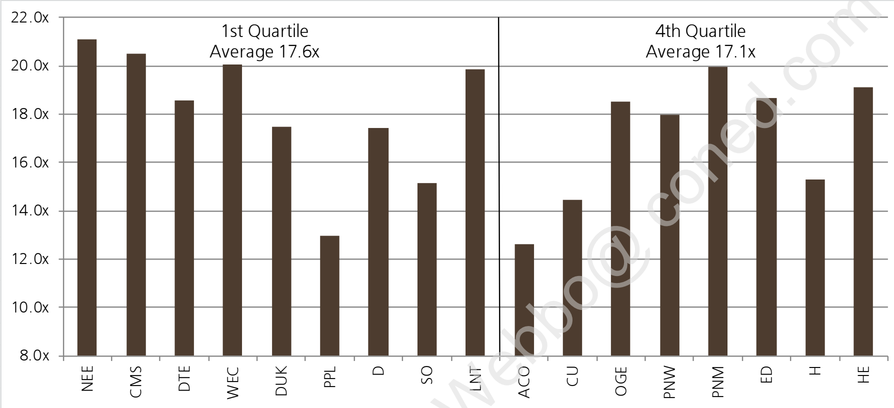
Below we show the top and bottom quartile names by earnings growth, regulatory jurisdiction and overall quality. The spread on forward year P/E premium from top to bottom quartile is 16% which is higher than the spread for growth (+12%) or regulation alone (+3%).

Figure 10: Utility, Parent and Other EPS Growth 1st/4th Quartiles



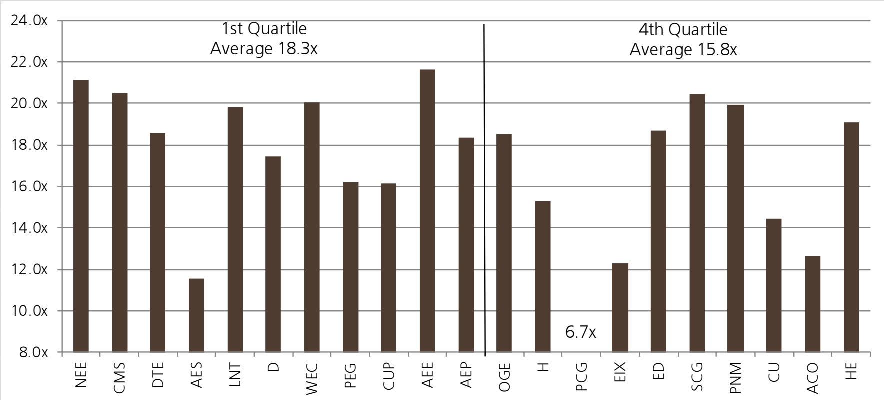
Source: FactSet, S&P Global Market Intelligence, UBS Equity Research

Figure 11: Regulatory Ranking 1st/4th Quartiles



Source: FactSet, S&P Global Market Intelligence, UBS Equity Research

Figure 12: Overall Quality Ranking 1st/4th Quartiles



Source: FactSet, S&P Global Market Intelligence, UBS Equity Research

Company Price Target and EPS Estimate Changes

AES Corp.

We are updating our AES $16 price target methodology. AES expects to achieve investment grade metrics in 2019 and 8-10% free cash flow growth to 2020 or $800M. We forecast 5 year EPS growth of 9% of which ½ comes from contracted renewable investments at double digit returns and could include some asset sales to achieve the growth. The company is de-risking AES Gener in Chile with the 270 MW Candelaria solar and wind project which reduces by 40% Gener's expiring hedged position in 2022.

Our current target of $16 is a sum of parts which reflects $13 for North America utilities, $4 each for South America, MCAC, and EurAsia regions less $8 for debt and 660M shares. This includes a 7% P/E premium of the 2021 Regulated Utility average or 17.7x $0.34 for the U.S. utilities, publicly traded market values for Gener in Chile and Tiete in Brazil, 7.6x 2021 EBITDA for EurAsia and 6.5x for the Mexico/Central America/Caribbean segment. The 7% premium reflects 5% for group undervaluation, 5% for top quartile growth, 2% for regulation, and -5% for sum of the parts discount.

Figure 13: AES Sum of the Parts - Current - Dollars in Millions

2021 Forecasts	EBITDA	Adjusted PTC	EPS	Ownership Debt	UBS Comps (f)	Multiple (g)	Value
U.S. Utilities	$609	$197	$0.34	$3,225	U.S. Regulated	17.5x	$6.04
U.S. Generation	$593	$389		$199	U.S. Multi Utility	7.2x	$6.19
El Salvador	$76	$52		$237	Regulated Utility	6.2x	$0.36
United States & Utilities	$1,279	$594		$3,660			$12.59
South America	$959	$574		$3,487			$4.22
Gener (b)	$665	$378		$2,883	Market Value	6.6x	$2.27
Argentina	$216	$165		$302	Lat Am	6.0x	$1.48
Tiete	$41	$17		$119	Market Value		$0.36
Other	$38	$14		$184		6.6x	$0.10
MCAC	$596	$349		$1,504		6.5x	$3.59
EurAsia	$394	$217		$822	60% Europe/40% Asia	7.6x	$3.26
Corporate	-$27	-$287		$3,664		6.0x	-$8.14
Total	$3,201	$1,447		$11,883		6.9x	$15.52
Shares							660
Unlisted Subs	$1,886			$6,911		6.1x	$6.85
Listed/DPL&IPL	$1,315			$4,973		8.1x	$8.67

(b) Publicly traded market values 11/27/18
(d) Price paid.
(f) Reflects 11/20 values from UBS Global Electric Utility Valuation
(g) Multiples are 2021 EV/EBITDA except U.S. Utilities which is P/E.

Source: Company reports, UBS equity research estimates, Factset

Figure 14: AES Sum of the Parts – Prior – Dollars in Millions

2020 Forecasts	EBITDA	Adjusted PTC	EPS	Ownership Debt	UBS Comps (f)	Multiple	Value
U.S. Utilities	$601	$197	$0.31	$3,347	U.S. Regulated	17.8x	$5.47
U.S. Generation	$566	$345		$277	U.S. Multi Utility	7.2x	$5.75
El Salvador	$76	$52		$237	Regulated Utility	6.2x	$0.36
United States & Utilities	$1,243	$594		$3,861			$11.58
South America	$929	$574		$3,393			$4.50
Gener (b)	$632	$378		$2,749	Market Value	6.9x	$2.46
Argentina	$216	$165		$310	Lat Am	6.2x	$1.56
Tiete	$43	$17		$151	Market Value		$0.40
Other	$38	$14		$184		6.2x	$0.08
MCAC	$596	$349		$1,503		6.5x	$3.59
EurAsia	$407	$217		$822	60% Europe/40% Asia	8.7x	$4.12
Corporate	-$40	-$287		$3,664		6.2x	-$8.24
Total	$3,136	$1,447		$11,883		7.1x	$15.55
Shares							660
Unlisted Subs	$1,860			$6,997		6.3x	$7.21
Listed/DPL&IPL	$1,276			$4,887		8.1x	$8.34

(b) Publicly traded market value 11/6/18
(d) Price paid.
(f) Reflects 10/31 values from UBS Global Electric Utility Valuation

Source: Company reports, UBS equity research estimates, Factset

Our prior $16 target reflected $12 for North America utilities, $4 each for South America, MCAC, and EurAsia regions less $8 for debt and 660M shares. This includes a 12% P/E premium of the 2020 Regulated Utility 15.9x average for the U.S. utilities, publicly traded market values for Gener in Chile and Tiete in Brazil, 8.7x 2020 EBITDA for EurAsia and 6.5x for the Mexico/Central America/Caribbean segment. The 12% premium included 10% for group undervaluation.

Alliant Energy

We are increasing our price target on LNT to $48 from $46. Our EPS estimates remain unchanged at $2.15 in 2018, $2.26 in 2019, $2.45 in 2020 and $2.54 in 2021. LNT is earning its allowed return in Wisconsin and under-earning slightly (20 bp) in Iowa for management compensation non-recovery which is consistent with our forecast. LNT expects to file 2 rate cases in Iowa in 2019 including one with a forward test year. LNT will likely request an increase in the equity ratio potentially to 51% from 49%.

Our current $48 price target is premised upon a 15% premium to the 2021E Regulated Utility P/E multiple or 18.9x 2021E EPS of $2.54. The premium includes 5% for the group undervaluation, 5% for EPS growth and 5% for regulation.

Previously our $46 target reflected a 17% premium and was 18.7x $2.45 in 2020. The prior multiple reflected a premium of 10% for group undervaluation, 5% for EPS growth and 2% for regulation.

Ameren Corp.

We are lowering our rating on Ameren to Neutral from Buy following good performance this year on the passage of Missouri legislation and delivering on guidance. See our separate note (LINK). Since passage of SB 564 in Missouri the stock is up 21% (+10% versus the XLU and +22% versus the S&P 500). We are fine-tuning our EPS estimates to $3.48 in 2020 and $3.85 in 2021 versus $3.50 and $3.87 previously due to the timing of the Missouri investments. The reduction in earnings relates to the timing lag for the deferral of return on wind investment under SB 564 versus the renewable tracker.

Our $71 price target is a 12% premium to the Regulated Utility average or 18.4x 2021E EPS of $3.85. It includes top quartile growth (+5%), above average regulation (+2%) and the impact of the Regulated Utility group discount (+5%).

The prior methodology for our $71 price target reflected a 17% premium applied to the average Regulated Utility P/E or 18.3x 2021E EPS of $3.87.

American Electric Power

We are increasing our price target on AEP to $85 from $83. Up next for AEP are integrated resource plan filings at PSO by 12/21/18 and SWEPCO (Arkansas) by 12/1/18. We also believe there is the opportunity to increase transmission spending at PSO and SWEPCO and in batteries in Texas. We maintain our EPS estimates of $3.93 for 2018, $4.18 for 2020, $4.46 in 2021 and $4.77 in 2022.

Our current price target of $85 is at a 9% premium to the Regulated Utility group and is 17.9x our $4.77 2021 EPS estimate. The valuation includes a 5% premium for the group's undervaluation, 2% for second quartile regulation and 2% for second quartile growth.

Our prior price target of $83 was 18.6x our $4.46 2020 EPS estimate based on a 14% group premium multiple. The premium previously included 10% for the group's undervaluation.

ATCO Ltd.

We reiterate our Buy rating. Upcoming catalysts include potential for Structures & Logistics to be sanctioned work for LNG Canada, sale of the unregulated power plants in Alberta, and potential for a PBR reopener at the Alberta Utilities Commission. We continue to believe that the Canadian Utilities business remains solid and see upside to shares from the unregulated Structures & Logistics and Naltume ports segments as well as any further infrastructure investments from capital proceeds from asset sales and incremental leverage at the ATCO Ltd. level.

We are updating our eps estimates to C$2.95/C$3.13/C$3.20/C$3.34 from C$2.96/C$3.29/C$3.38/C$3.54 for '18-'21E respectively. We are increasing our price target to C$49 from C$47 premised upon multiple expansion and a roll to the 2021 valuation year.

Our prior price target of C$47 was premised upon a SOTP analysis on our UPO eps in 2020E of C$2.96, the group multiple of 15.2x at a 5% discount. A comparable group multiple of 16.8x our Structures & Logistics eps estimate of C$0.32 in 2020. And finally a 7.5x ports 2020E EV/EBITDA multiple times our Naltume Ports 2020E EBITDA of C$56mln on allocated debt of C$340mln.

Our current price target of C$49 is premised upon a 5% discount to the 15.9x 2021E normalized non-gas midstream multiple and our UPO (utility & parent only) 2021E eps of C$2.91 which yields C$44/share. To this we add 15.1x our 2020E S&L eps of C$0.30 which yields C$4.60/share and 7.6x our Naltume Ports EBITDA of C$56mln with C$340mln of allocated debt which yields C$0.70/share.

Figure 15: ATCO Sum of the Parts

UPO EPS	$ 2.91		S&L EPS	$ 0.30
Multiple	15.9x		Multiple	15.1x
Cdn Value vs. Bonds	10%		S&L Value	$ 4.60
Regulatory Ranking	-5%			
Growth	-5%		Neltume '20E EBITDA	56
Company Specific	-5%		EV/EBITDA	7.6x
Total Net Prem/Disc	-5%		Allocated Debt	$ 340
Utility Value	$ 43.95		Neltume Value	$ 0.70
SOTP Value	**$ 49**			

Source: Company reports, UBS equity research

Canadian Utilities Ltd.

We reiterate our Neutral rating. While we see potential upside from continued investment in Alberta Power Line and continued growth in Alberta we see risks to the potential for a PBR reopener in Alberta and the less constructive Alberta regulatory environment.

We are updating our eps estimates to C$2.06/C$2.15/C$2.21/C$2.31 from C$2.07/C$2.27/C$2.35/C$2.46 for '18-'21E respectively. We are maintaining our price target at C$33 premised upon multiple expansion and a roll to the 2021 valuation year, offset by an increased discount for reopener regulatory risk in Alberta.

Our prior target of C$33 was premised upon a 5% discount to the 15.2x group multiple on 2020 estimated earnings per share of C$2.35.

Our current target of C$33 is premised upon a 10% net discount to the 15.9x 2021E normalized non-gas midstream multiple and our 2021E eps of C$2.31.

Caribbean Utilities

We are upgrading Caribbean Utilities to Neutral from Sell on valuation. See our separate note (LINK). We are updating our eps estimates to $0.71/$0.77/$0.80/$0.89 from $0.71/$0.78/$0.83/$0.94 for '18-'21E respectively. We are increasing our price target to $13 from $12 due to multiple expansion and a roll to the 2021 valuation year.

Our prior target of $12 was premised upon a group multiple of 15x our 2020E eps of $0.83.

Our current target of $13 is premised upon a 6% net discount to the 15.9x 2021E normalized non-gas midstream multiple and our 2021E eps of $0.89.

CMS Energy

We are raising our price target to $55 from $54 and fine-tuning our EPS estimates. Our new estimates reflect 8% EPS growth off the high-end of the 2019 $2.46-$2.50 EPS guidance range. Our revised EPS estimates are $2.50 for 2019, $2.70 for 2020 and $2.92 for 2021 versus $2.53/$2.73/$2.95 previously.

CMS expects to receive a proposal for decision in the electric rate case in December and an order in March 2019 and an order in the integrated resource plan proceeding in April 2019 although the company has a track record for achieving partial settlements. We also look for more use of renewable development with the green tariffs in Michigan.

Our $55 price target for CMS is a 15% premium to the Regulated Utility group and is 18.9x our $2.92 2021 EPS estimate. The premium includes a 5% premium for the group's undervaluation, 5% for first quartile Michigan regulation and 5% for first quartile growth.

Our prior $54 target was 19.6x 2020E EPS of $2.73 and included 10% for group undervaluation, 5% for first quartile Michigan regulation and 5% for first quartile growth.

Consolidated Edison

We are increasing our price target on ED to $85 from $80. We expect ED to close the Sempra Solar transaction this year and to file the Consolidated Edison of New York general rate case in early 2019. Despite the fourth quartile ranking for regulation the company has done 8-10 Reforming the Energy Vision projects which have been treated with reasonable regulation. This includes a regulatory mechanism where the company retains 30% of the savings achieved on investments. REV projects also have a 10 year amortization.

Our current price target is at a 5.5% premium to the Regulated Utility average multiple or 17.2x our 2021 EPS estimate of $4.93. The premium includes 5% for the group's undervaluation, -5% for fourth quartile New York regulation, -2% for third quartile growth and a 7.5% ESG (Environmental, Social and Governance) premium for not owning generation.

Our prior $80 price target was 17.5x our 2020 EPS estimate of $4.60. The methodology included 10% for group undervaluation, 7.5% for ESG, -5% for regulation and -2% for growth.

Dominion Energy

We are upgrading our rating on D to Buy from Neutral on valuation and resolution of the financing uncertainty experienced during 2018. See our separate note (LINK). Our estimates exclude SCG; however, the probability of deal close seems increasingly likely with the BLRA lawsuit settlement, providing upside to our estimates. Our price target increases to $84 from $75, based on a sum of the parts methodology that includes $44 for VEPCO, $37 for Gas Infrastructure (including Cove Point) and $4 for Merchant Generation. The outcome of the CT Zero Carbon RFP could impact our estimates. We assume Millstone sells all production at an average energy price of ~$47/MWh in 2021 versus the forward energy price of $43/MWh. Every $1/MWh change in energy price is approximately $0.01 to EPS.

Our estimates are revised up to $4.10 in 2018, $4.25 in 2019, $4.46 in 2020 and $4.71 in 2021, from $4.10, $4.16, $4.35 and $4.58, respectively.

Our current price target of $84 is premised upon VEPCO valued at a 12% net premium to the 16.4x 2021e Regulated Utility multiple, Gas Infrastructure (including Cove Point) valued at the average Gas Midstream 2021e P/E of 16.5x, and Merchant Generation is assigned a 7.2x mid-cycle EV/EBITDA multiple.

Our prior price target of $75 was premised upon VEPCO valued at a 17% net premium to the 15.9x 2020e Regulated Utility multiple, Gas Infrastructure (including Cove Point) valued at a 10% discount to the average Gas Midstream

2020e P/E of 15.9x, and Merchant Generation is assigned a 7.2x mid-cycle EV/EBITDA multiple.

DTE Energy

We are increasing our price target on DTE to $121 from $118. We believe DTE is in a good position having replaced expiring Power and Industrial tax credits in 2020 and 2022. At the margin we look for DTE to continue working to add contracts and to fill the NEXUS pipeline; to continue working on renewable investments through green tariffs and to add investments in tax advantaged renewable natural gas which is animal gas and biodegradable vegetation.

Our current $121 price target is a sum of the parts valuation which includes $91 for utility, parent and other at a 12% premium 2021E P/E multiple of 18.4x $4.98, plus $24 for unregulated EPS of $1.45 at a 16.5x gas conglomerate multiple, $4 for co-gen and renewables and $2 for the NPV of renewable energy fuel tax credits.

Our prior price target of $118 assumed $87 for the utility, parent and other which included a 10% benefit for the group's undervaluation. The UP&O was a 17% P/E premium 19.2x applied to 2020E EPS of $4.53, $27 for unregulated EPS of $1.44 at a 19x gas conglomerate multiple, $3 for co-gen and renewables and $1.50 for the NPV of REF tax credits.

Figure 16: DTE Sum of the Parts

DTE	EPS 2021E	Premium/ Multiple	Value
UP&O	$4.98	12.0%	$91
Unregulated	$1.45	16.5x	$24
Co-Gen	$0.27	16.4x	$4
Renewable Energy Fuel Tax Credits			$2
Total			$121

Source: Company reports, UBS equity research

Duke Energy

We are increasing our price target on DUK to $99 from $92. Our new price target is premised upon a 17.7x multiple to our 2021e EPS of $5.59, or a net 8% premium to the Regulated Utility P/E multiple. Previously our $92 price target reflected a 13% P/E premium to the Regulated Utility P/E multiple on 2020e EPS of $5.29.

Our estimates are revised up to $4.74 in 2018, $5.03 in 2019, $5.33 in 2020 and $5.59 in 2021, from $4.74, $5.03, $5.29 and $5.56, respectively. The revisions reflect increased confidence in DUK's ability to meet capital investment and growth targets.

Emera Inc.

We are upgrading Emera Inc. to Buy from Neutral on valuation and the likelihood of accretive asset sales filling in the C$1.4Bln block equity need through 2021. See our separate note (LINK). We are updating our eps estimates to C$2.68/C$2.80/C$3.10/C$3.26 from C$2.68/C$2.91/C$3.05/C$3.21 for '18-'21E respectively. We are increasing our price target to C$51 from C$42 on multiple expansion, a roll to the 2021 valuation year, and including generation asset sale proceeds in lieu of block equity.

Our prior price target of C$42 was premised upon SOTP valuation which is a 10% premium to the group multiple of 14.5x on utility and parent only (UPO) EPS of $2.55 in 2020E yielding $40 to which we added $2/share for the Energy segment at 7.2x 2020E EBITDA.

Our current price target of C$51 is premised upon a net 5% premium to the 15.9x 2021E normalized non-gas midstream multiple and our '21E UPO eps of C$3.01 which yields C$50/share. To this we add 6.7x our '21E Energy EBITDA of C$51mln with no allocated net debt which yields C$1/share.

Figure 17: EMA Sum of Parts

UPO EPS	$	3.01		Energy EBITDA	51
Multiple		15.9x		Multiple	6.7x
Overall Reg. Group		10%		Enterprise Value	336
Regulatory Prem/Disc		2%		Net Debt	-
Earnings Growth Prem/Disc		-2%		Equity Value	336
Net Premium		5%		Shares Out	277.1
Utility Valuation	$	50		Energy Valuation	$ 1
Consoliatdated Valuation	**$**	**51**			

Source: Company reports, UBS equity research

Entergy Corp

We are increasing our price target on ETR to $99 from $94. Our new price target is premised upon a 17.2x multiple to our 2021e EPS of $5.73, or a net 5% premium to the Regulated Utility P/E multiple.

Our previous $94 price target reflected a 10% premium to the Regulated Utility P/E multiple on 2020e EPS of $5.40. Our EPS estimates remain unchanged at $4.70 in 2018, $5.09 in 2019, $5.40 in 2020 and $5.73 in 2021.

Evergy

We are increasing our price target on EVRG to $61 from $58. EVRG is in the process of executing on the 60M (22% of shares) stock buyback and we expect an update on the implications of Missouri's SB 564 on the fourth quarter conference call. We also expect a cap-ex update including with regard to grid modernization in Missouri.

Our current $61 price target is at an 8% premium to the Regulated Utility average or 17.7x 2021E EPS of $3.44 plus $0.42/share for the NPV of corporate owned life insurance. The 8% premium includes +5% for the group's undervaluation, +5% for top quartile EPS growth of 8% and -2% for below average regulation.

Our prior $58 price target reflected a +10% for valuation and was 17.8x $3.25 in 2020E plus $0.42/share for COLI.

Eversource Energy

We are increasing our price target on ES to $75 from $69. Our new price target is premised upon an 18.9x multiple to our 2021e EPS of $3.95, or a net 15%

premium to the Regulated Utility P/E multiple. Previously our $69 price target reflected an 18% P/E premium to the Regulated Utility P/E multiple on 2020e EPS of $3.72. Our EPS estimates remain unchanged at $3.28 in 2018, $3.48 in 2019, $3.72 in 2020 and $3.95 in 2021.

Exelon Corp.

We reiterate our Buy rating. We continue to believe that Exelon has solid utility growth driven by capital spending and closing the gap between earned and allowed ROEs particularly at the Pepco Holdings utility subsidiaries. We are updating our eps forecast to $3.14/$3.18/$3.14/$3.25 from $3.14/$3.19/$3.16/$3.29 for '18-21E respectively. We are increasing our price target to $51 from $50 premised upon multiple expansion and a roll to the 2021 valuation year for the utility and the 2020 valuation year for ExGen.

Our prior price target of $50 was premised upon a net 17% premium to the group multiple of 16.1x our 2020E UPO eps of $2.05, and 6.7x '19E open EBITDA of $2,585mln for ExGen.

Our current price target of $51 is premised upon a net 8% premium to the 16.4x normalized multiple and our 2021E UPO eps of $2.21 which yields $40/share. To this we add 7.2x our 2020E ExGen open EBITDA of $2,257mln, NPV of hedges of $196mln, net debt of $6,126mln, and 949mln shares outstanding which yields $11/share.

Figure 18: EXC Sum of Parts – Dollars in Millions

SOTP Valuation Methodology		ExGen Valuation	
UPO Valuation		EXGEN EBITDA	2,383
20 UPO EPS	$ 2.21	GM Value of Hedges	126
Regulated Utlity Group Multiple	16.4x	EXGEN Open EBITDA	2,257
Overall Regulated Group	5%	Net Multiple for ExGen	7.2x
Regulatory Ranking	-2%	Total Enterprise Value	16,250
Earnings Growth	5%	NPV of Hedges	196
Net Premium/Discount	8%	Net Debt at ExGen	6,126
UPO Value per Share	**$ 40**	Equity Value	10,320
		Shares	949
Total Value per Share	**$ 51**	**ExGen Value per Share**	**$ 11**

Source: Company reports, UBS equity research

FirstEnergy Corp.

Our price target on FE remains unchanged at $43. Management has stated they plan to provide additional cap-ex guidance on the fourth quarter conference call which could include an additional year (2022). Before increasing cap-ex FE wants to see outcomes on the New Jersey $0.4B infrastructure plan proposal (potentially in Q1'19) and the Ohio SEET (significantly excessive earnings test).

Our price target is updated to reflect a 2% premium to the Regulated Utility P/E multiple or 16.7x 2021E EPS of $2.60. The 2% premium includes 5% for the group's undervaluation, 2% for regulation and -5% for fourth quartile EPS growth.

Previously our $43 reflected a 7% P/E premium to the Regulated Utility group or 17.2x $2.46 in 2020E plus $0.28 for Ohio rider NPV. The premium included 10% for the group's undervaluation.

Fortis Inc.

We are reiterating our Buy rating and continue to believe that Fortis Inc remains undervalued to achievable 6% long term dividend per share growth with lower relative risk resulting from no need block equity, and no significantly large scale capital projects. Further, regulatory matters are limited over the next 12 month with FERC transmission ROEs now settled for the ITC subsidiary.

We are updating our eps estimates to C$2.52/C$2.64/C$2.83/C$3.01 from C$2.52/C$2.65/C$2.84/C$3.01 for '18-'21E respectively. We are updating our price target to C$53 from C$49 on multiple expansion and a roll to the 2021 valuation year.

Our prior price target of C$49 was premised upon a net 14% premium to the group multiple of 15.1x our 2020E eps of C$2.84.

Our current price target of C$53 is premised upon a net 10% premium to the 15.7x 2021E normalized non-gas midstream multiple and our 2021E eps of C$3.01.

Hawaiian Electric Industries

Our price target for HE remains unchanged at $33. Our price target is updated to reflect a 16.7x multiple to our 2021e EPS of $2.19, or a net 2% premium to the Regulated Utility P/E multiple. Previously our $33 target reflected no premium to the Regulated Utility P/E multiple on 2020e EPS of $2.29.

Our EPS estimates are revised up to $1.86 in 2018, $1.99 in 2019, $2.12 in 2020 and $2.19 in 2021, from $1.89, $2.05, $2.20 and $2.29, respectively. The revisions reflect increased confidence in HE's ability to meet capital investment and growth targets.

Hydro One Ltd.

We reiterate our Sell rating. We now believe that, despite being dilutive that the merger with Avista Inc. will close after likely regulatory approvals are received on December 14. As a result we have incorporated the AVA merger dilution into our valuation methodology.

Our eps forecast remains Hydro One Ltd. on a stand-alone basis as we are updating it to C$1.27/C$1.27/C$1.35/C$1.41 from C$1.23/C$1.32/C$1.34/C$1.51 for '18-'21E respectively. We are updating our price target to C$18 from C$19 as a result of the inclusion of the AVA merger dilution in our valuation and lower stand-alone Hydro One eps estimates more than offsetting multiple expansion and the roll to the 2021 valuation year.

Our prior price target of C$19 was premised upon a 14.8x multiple on our 2020E eps of C$1.34.

Our current price target of C$18 is premised upon a net 15% discount to the 15.9x 2021E normalized non-gas midstream multiple and our 2021E eps of C$1.37 inclusive of ($0.04)/share of dilution from the AVA merger.

NextEra Energy

We are increasing our price target on NEE to $209 from $195. Our new price target is premised upon an 18.9x multiple to our 2021e EPS of $9.84, or a net 15% premium to the Regulated Utility P/E multiple. Previously our $195 price target reflected a 20% P/E premium to the Regulated Utility P/E multiple on 2020e EPS of $9.06.

Our EPS estimates are revised up to $7.77 in 2018, $8.43 in 2019, $9.08 in 2020 and $9.84 in 2021, from $7.88, $8.41, $9.06 and $9.74, respectively. The revisions incorporate the Gulf Power acquisition which is expected to close 1Q19, offset somewhat by a more conservative growth trajectory than we had previously modelled at NEER.

OGE Energy

We are raising our price target to $40 from $37. OGE expects to have 1 or more rate cases in 2019 to address investments in the Sooner scrubbers and potentially in grid modernization. We fine-tuned our EPS estimates for cap-ex guidance to $2.07 for 2018, $2.12 for 2019, $2.31 for 2020 and $2.39 in 2021 versus $2.08/$2.14/$2.30/$2.38.

Our current $40 price target is a sum of the parts which includes $30 for the utility, parent and other at a 2% discount to the Regulated Utility average or 16.1x $1.86 in 2021 plus $10 for the company's 25.6% ownership in ENBL. The ENBL valuation reflects UBS MLP and Gas Pipeline analyst Shneur Gershuni's $18 price target. "'19 Guidance Flexes Op Leverage & SCOOP Crude" (11/7/18). The 2% discount multiple includes 5% for the group undervaluation, -2% for third quartile utility, parent and other EPS growth and -4% for fourth quartile regulation.

Our prior $37 price target reflected $30 for UP&O which at a 3% premium to the average Regulated Utility 2020 P/E or 16.7x $1.75 at UP&O and $7/share for ENBL using a mark-to-market for the stock.

Figure 19: OGE Sum of the Parts

OGE	EPS 2021E	Premium/ Multiple	Value
UP&O	$1.86	-2.0%	$30
	$/Share		
ENBL	$18.00		$10
Total			$40

Source: Company reports, UBS equity research

Pinnacle West Capital

We are increasing our price target on PNW to $92 from $90. Our current $92 target is a 2% premium to the Regulated Utility group of 16.7x our 2021 EPS estimate of $5.52. The premium is 5% for the group's undervaluation, 2% for second quartile EPS growth, and -5% for fourth quartile regulation.

Our prior $90 price target was a 5% premium to the Regulated Utility group average P/E of 17.0x $5.28 in 2020E. The valuation multiple had included a -2% discount for third quartile regulation.

PNM Resources

We are increasing our price target on PNM to $39 from $37. Our new price target is premised upon a 16.9x multiple to our 2021e EPS of $2.29, or a net 3% premium to the Regulated Utility P/E multiple.

Previously our $37 price target reflected an 8% premium to the Regulated Utility P/E multiple on 2020e EPS of $2.19. Our EPS estimates remain unchanged at $1.97 in 2018, $2.14 in 2019, $2.19 in 2020 and $2.29 in 2021.

Portland General

We are lowering our price target on POR to $44 from $45. Consistent with guidance we are revising our EPS estimates to reflect 80 bp of regulatory lag versus 50 bp previously (8.7% ROE versus 9.0% earned ROE). Our revised EPS estimates are $2.48 for 2019, $2.57 for 2020, $2.65 for 2021 and $2.73 for 2022 versus $2.53 for 2019, $2.64 for 2020, $2.78 for 2021 and $2.87 for 2022.

Our $44 price target is a 2% premium to the Regulated Utility average or 16.7x $2.65 in 2021E. The valuation includes 5% for the group's undervaluation, 2% for second quartile Oregon regulation, and -5% for 4th quartile EPS growth.

Our prior $45 price target reflected a 6% Regulated Utility premium or 17.1x $2.64 in 2020E and included a 10% benefit the group's undervaluation and 2% discounts for 3rd quartile growth and regulation.

PPL Corporation

We maintain our Buy rating and our $34 price target. We are fine-tuning our EPS estimates for exposure to the British pound and for the gradual expiration of pension revenues in the U.K. at WPD. Our new EPS estimates are $2.34 for 2018, $2.40 for 2019, and $2.56 for 2020 versus $2.33/$2.42/$2.56. Our estimates include 7% 5 year growth (2017-2022) in Pennsylvania, 4% in Kentucky and 1% at WPD in the U.K.

F/X. Our EPS forecast assumes a 1.30x US$/British pound exchange in 2020 and 1.37x for 2021-2022 which is the UBS Global Macro Strategy year-end 2020 forecast "2019 Markets Outlook: Something wicked this way comes?"(pp. 34-35, 11/12/18). This is a -$0.04/share to -$0.06/share impact from 2020 to 2023 versus our prior forecast.

Pension. PPL receives $0.20/share in revenue to fund the pension deficit, but the plan has been outperforming. Pending a review at regulator OFGEM we expect the pension revenue will begin a 4 year calendar year expiration in April 2021. This is a -$0.05 to -$0.07/share annual impact.

EPS growth-U.K. and Pennsylvania. We continue to forecast 5 year 1% EPS growth in the U.K. as we believe we have been understating the impact of 6% rate base growth and incentive opportunities. We also believe PPL's PPL Electric in Pennsylvania can grow EPS 6-7% versus 5-6% previously due to transmission investments.

Our current $34 price target reflects the sum of $21 for a 5% premium to the U.S. utility average or 17.2x $1.23 in 2021E, $15 for a European average utility multiple of 12.5x $1.22, less $4 for the NPV of a -$0.24 exposure in the 2023 RIIO 2 case at a $13.6x P/E. The 5% U.S. premium includes 5% for the group's undervaluation, 2% for second quartile regulation, and -2% for third quartile EPS growth.

Figure 21: PPL Sum of the Parts

PPL	EPS 2021E	Premium/ Multiple	Value
U.S. Utilities	$1.23	5.0%	$21
WPD	$1.36	12.5x	$17
NPV of RIIO 2 Rate Exposure			($4)
Total			$34

Source: Company reports, UBS equity research

Public Service Enterprise Group

We are raising our price target on PEG to $63 from $60. We are fine-tuning our EPS estimates for changes in the forward power and gas curves. Forward around the clock power prices rose in PJM East $5/MWhr around-the-clock in 2019 and $1/Mwhr in 2020 from early October to mid-November according to S&P Global Market Intelligence quotes. Gas prices spiked at Henry hub and Leidy hub 40 cents. These impacts tapered off in 2021 and 2022.

We are lowering our EPS estimates to reflect lower profitability on combined cycle gas plants and an offsetting benefit for higher power prices. Our revised estimates are $3.35 in 2019, $3.69 in 2020, $3.77 in 2021 and $4.02 in 2022 versus $3.47/$3.66/$3.76/$4.04. PEG's baseload generation is 100% hedged through 2019 and 75-80% in 2020 and the intermediate, combined cycle and peaking output is 35-40% hedged in 2019.

Our current $63 sum of the parts based price target includes: $51 for UP&O or 18.4x our 2021 EPS estimate of $2.79 plus $11 for PSEG Power at 6.8x 2021 EBITDA of $1.05B. The premium includes: first quartile EPS growth for utility net of parent 12% (+5%), above-average New Jersey regulation (+2%) and a premium for the Regulated Utility group's undervaluation (+5%).

Previously our $60 price target included $47 for PSE&G using a 12% Regulated Utility premium 2020E P/E multiple of 16.1x applied to $2.59 of UP&O EPS and $13 for PSEG Power at 7.2x $1.1B less $1.7B of debt and 508M shares.

Figure 22: PEG Sum of the Parts – Dollars in Millions

PEG	EPS 2021E	Premium/ Multiple	Value
UP&O	$2.79	12.0%	$51
	$/Share		
PSEG Power	$1,046	6.8x	$11
Total			$63

Source: Company reports, UBS equity research

SCANA Corp.

We are updating our price target to $49 from $41. Given the pending Dominion merger we are not rolling our valuation to the 2021 year rather we are reflecting the value of the Dominion merger which is Dominion's closing price of

$74.11/share at the 0.669 exchange ratio. See our separate note (LINK). Our 2020E SCANA Corp. stand-alone valuation is $41 premised upon 2020E eps under the ORS securitization scenario of $2.35 in 2020 and our updated normalized utility comp group multiple of 17.3x.

We are reiterating our Neutral rating. We are updating our eps estimates to be reflective of the earnings power from the latest Dominion Energy rate proposal before the South Carolina Public Service commission commensurate with no up-front refund but an approximate 15% on-going rate cut as a result of the abandoned V.C. Summer Unit 2 and Unit 3 new nuclear construction project. Our eps forecast is updated to $2.67/$2.30/$2.44/$2.66 from $3.13/$2.76/$2.90/3.12 for '18-'21E respectively.

Our prior price target of $41 was premised upon a 50/50 view of acquisition break/close which results in our $41 price target premised upon the $46/share full value takeout price and our $35/share value on break and the ORS terms with securitization.

Sempra Energy

Our current price target of $129 is premised upon a sum of the parts. We value SDG&E, SoCalGas, Oncor and Parent at a 1% net premium to the 16.4x 2021e Regulated Utility multiple ($75), Cameron at the average Gas Midstream 2021e P/E of 16.5x ($22), other LNG & Midstream at a 5% discount to the average Gas Midstream P/E (-$2), and approximate the mark-to-market for SRE Mexico ($11) and SA Utilities ($6). This derives a value of $112 for the shares. We calculate an upside value of ~$146 under execution of an Elliott-inspired strategy. Our price target is based on an average of these outcomes.

Our prior target of $130 was derived with the same methodology, using 2020 estimates in the base case to arrive at values of $68 for the Utilities and Parent, $24 for Cameron, ($4) for other LNG & Midstream, $15 for SRE Mexico, and $8 for SA Utilities, for total base case value of $111. Our Elliott Plan upside value was $149. Our price target reflected the average of those two outcomes.

Our 2018 EPS estimate is revised up to $5.46 from $5.31. Our other estimates remain unchanged at $5.89 in 2019, $6.99 in 2020 and $7.55 in 2021.

Southern Company

We are reiterating our Neutral rating. Our eps estimates remain unchanged at $33.06/$3.04/$3.17/$3.30 for '18-'21E respectively. We are reiterating our price target of $49 as inclusion of an additional 5% discount for the Georgia triennial rate case year in 2019 balances the impact of multiple expansion and a roll to the 2021 valuation year.

Our prior price target of $49 was premised upon a net 5% discount to the group multiple of 15.7x our 2020E eps of $3.17.

Our current price target of $49 is premised upon a net 10% discount to the 16.4x normalized multiple and our 2021E eps of $3.30.

WEC Energy Group

We are increasing our price target on WEC to $73 from $70. Our new price target is premised upon an 18.4x multiple to our 2021e EPS of $3.97, or a net 12% premium to the Regulated Utility P/E multiple. Previously our $70 price target reflected a 17% premium to the Regulated Utility P/E multiple on 2020e EPS of $3.74. Our EPS estimates remain unchanged at $3.34 in 2018, $3.54 in 2019, $3.74 in 2020 and $3.97 in 2021.

Xcel Energy

We are increasing our price target on XEL to $53 from $50. Our new price target is premised upon a 17.9x multiple to our 2021e EPS of $2.95, or a net 9% premium to the Regulated Utility P/E multiple. Previously our $50 price target reflected a 14% premium to the Regulated Utility P/E multiple on 2020e EPS of $2.77. Our EPS estimates remain unchanged at $2.47 in 2018, $2.60 in 2019, $2.77 in 2020 and $2.95 in 2021.

Valuation Method and Risk Statement

Our valuation methodology for the group is price to earnings based. The adjustments applied fall into 5 categories. These are as follows: 1) Group Valuation Bias: Flowing from our valuation work comparing Baa corporate yields to group dividend yields and RU price to earnings ratios to those for the S&P 500, we incorporate a positive or negative adjustment to our group multiple representing the gap we calculate to the nearest 5%; 2) Growth Adjustment: We adjust our valuations based on the growth quartile each utility occupies. First quartile receives a 5% premium, second quartile a 2% premium, third quartile a 2% discount and fourth quartile a 5% discount; 3) Regulatory Adjustment: Our valuation adjustments for regulation are based on our proprietary Regulatory Rankings. First quartile jurisdictions receive 5%, second quartile 2%, third quartile -2% and fourth quartile -5%; 4) Multi Utility Diversified Valuation: For multi utilities (those with more than 15% diversified or foreign earnings), we perform a sum-of-parts analysis applying business/region appropriate valuations to those diversified businesses; 5) One-off Adjustments: In special situations, we value risk on an issue specific basis. Common areas where we apply such an adjustment include: ESG advantage, large project construction risk, legal risk, and announced M&A completion risk.

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12-Month Rating	**Definition**	**Coverage**[1]	**IB Services**[2]
Buy	FSR is > 6% above the MRA.	48%	24%
Neutral	FSR is between -6% and 6% of the MRA.	37%	21%
Sell	FSR is > 6% below the MRA.	15%	12%
Short-Term Rating	**Definition**	**Coverage**[3]	**IB Services**[4]
Buy	Stock price expected to rise within three months from the time the rating was assigned because of a specific catalyst or event.	<1%	<1%
Sell	Stock price expected to fall within three months from the time the rating was assigned because of a specific catalyst or event.	<1%	<1%

Source: UBS. Rating allocations are as of 30 September 2018.
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2:Percentage of companies within the 12-month rating category for which investment banking (IB) services were provided within the past 12 months.
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Company Name	Reuters	12-month rating	Short-term rating	Price	Price date
AES Corp[16]	AES.N	Neutral	N/A	US$15.51	28 Nov 2018
Alliant Energy Corp[16]	LNT.N	Neutral	N/A	US$44.77	28 Nov 2018
Ameren Corp[16]	AEE.N	Neutral	N/A	US$68.11	28 Nov 2018
American Electric Power Inc[2, 4, 6a, 7, 16]	AEP.N	Buy	N/A	US$76.22	28 Nov 2018
ATCO Ltd	ACOx.TO	Buy	N/A	C$40.11	28 Nov 2018
Canadian Utilities Ltd	CU.TO	Neutral	N/A	C$31.28	28 Nov 2018
Caribbean Utilities Corp	CUPu.TO	Neutral	N/A	US$12.50	28 Nov 2018
CMS Energy Corp[16]	CMS.N	Neutral	N/A	US$51.23	28 Nov 2018
Consolidated Edison Inc[16]	ED.N	Neutral	N/A	US$78.84	28 Nov 2018
Dominion Energy Inc[4, 6a, 6c, 7, 16]	D.N	Buy	N/A	US$73.32	28 Nov 2018
DTE Energy Co[4, 6a, 7, 16]	DTE.N	Neutral	N/A	US$117.40	28 Nov 2018
Duke Energy Corp[2, 4, 6a, 7, 16]	DUK.N	Buy	N/A	US$87.60	28 Nov 2018
Emera Inc	EMA.TO	Buy	N/A	C$44.11	28 Nov 2018
Enable Midstream Partners LP[16]	ENBL.N	Buy	N/A	US$13.44	28 Nov 2018
Entergy Corp[7, 16]	ETR.N	Buy	N/A	US$86.08	28 Nov 2018
Evergy, Inc[16]	EVRG.N	Neutral	N/A	US$59.13	28 Nov 2018
Eversource Energy[7, 16]	ES.N	Buy	N/A	US$67.43	28 Nov 2018
Exelon Corp[7, 16]	EXC.N	Buy	N/A	US$45.82	28 Nov 2018
FirstEnergy Corp[16]	FE.N	Buy	N/A	US$37.60	28 Nov 2018
Fortis Inc[7, 16]	FTS.TO	Buy	N/A	C$45.70	28 Nov 2018
Hawaiian Electric Industries Inc[16]	HE.N	Sell	N/A	US$37.94	28 Nov 2018
Hydro One	H.TO	Sell	N/A	C$19.53	28 Nov 2018
NextEra Energy Inc[4, 6a, 7, 16, 26]	NEE.N	Buy	N/A	US$178.05	28 Nov 2018
OGE Energy Corp[16]	OGE.N	Neutral	N/A	US$39.11	28 Nov 2018
PNM Resources Inc[7, 16]	PNM.N	Sell	N/A	US$42.76	28 Nov 2018
Portland General Electric Co[16]	POR.N	Sell	N/A	US$47.96	28 Nov 2018
PPL Corp[2, 4, 6a, 6b, 6c, 7, 16]	PPL.N	Buy	N/A	US$30.86	28 Nov 2018
Public Service Enterprise Group[7, 16]	PEG.N	Buy	N/A	US$54.71	28 Nov 2018

Source: UBS. All prices as of local market close.
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MOODY'S
INVESTORS SERVICE

CREDIT OPINION
2 November 2018

Update

Rate this Research

RATINGS

Consolidated Edison Company of New York, Inc.

Domicile	New York, New York, United States
Long Term Rating	A3
Type	LT Issuer Rating
Outlook	Stable

Please see the ratings section at the end of this report for more information. The ratings and outlook shown reflect information as of the publication date.

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CLIENT SERVICES

Americas	1-212-553-1653
Asia Pacific	852-3551-3077
Japan	81-3-5408-4100
EMEA	44-20-7772-5454

Consolidated Edison Company of New York, Inc.

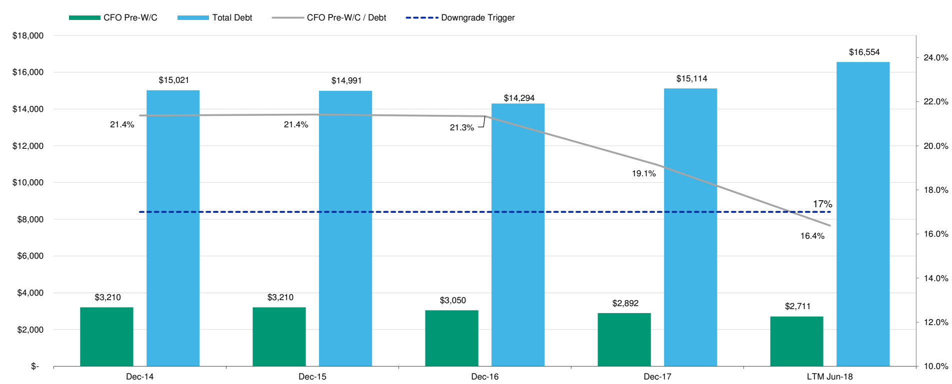
Update following downgrade to A3

Summary

Consolidated Edison Company of New York, Inc's (CECONY, A3 stable) credit is supported by 1) its low business risk as a transmission and distribution utility, 2) supportive regulatory environment in New York and 3) predictable cash flow and financial metrics provided by a suite of cost recovery provisions and multi-year rate plan.

CECONY's credit is constrained by 1) high capital spending requirements and dividend payout, resulting in sizeable negative free cash flow, 2) stagnant cash flow prospects as tax reform begins to impact financials and 3) longer term, the company must contend with the operational demands that accompany changing customer preferences.

Exhibit 1
Historical CFO Pre-WC, Total Debt and CFO Pre-WC to Debt ($ MM)



Source: Moody's Financial Metrics

Credit strengths

» Low business risk transmission and distribution utility serving the largest city in the US

» New York regulation provides a suite of supportive cost recovery mechanisms

» Stable and predictable cash flow generated by around $26 billion of rate base

Credit challenges

» Stagnant cash flow generation expected due to tax reform

» High capex requirements and high dividend payout drive higher debt levels

» State's move toward more renewable energy creates new operating demands

» Moderate carbon transition risk as a T&D utility with no generation ownership

Rating outlook

CECONY's stable outlook incorporates e declining financial profile, such as the ratio of cash flow from operations before changes in working capital (CFO pre-WC) to debt falling to 16-17% from over 20% historically. The outlook also reflects a supportive and predictable regulatory environment that will continue through the company's next rate case filing in 2019 and the concentration of rate base in a single regulatory jurisdiction.

Factors that could lead to an upgrade

» CFO pre-WC to debt approaching 25%

» CFO pre-WC less dividends to debt nearing 20%

» Improved cost recovery provisions or other regulatory support

Factors that could lead to a downgrade

» CFO pre-WC to debt declining consistently below 17%

» A less predictable regulatory environment or reduced cost recovery provisions

Key indicators

Exhibit 2

Consolidated Edison Company of New York, Inc. [1]

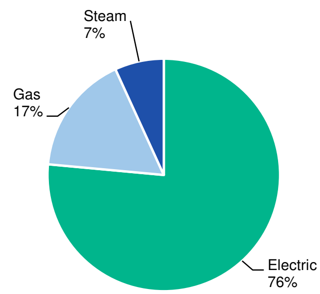
	Dec-14	Dec-15	Dec-16	Dec-17	LTM Jun-18
CFO Pre-W/C + Interest / Interest	6.3x	5.6x	5.5x	5.2x	4.8x
CFO Pre-W/C / Debt	21.4%	21.4%	21.3%	19.1%	16.4%
CFO Pre-W/C – Dividends / Debt	16.6%	15.6%	16.1%	13.9%	11.4%
Debt / Capitalization	43.8%	42.8%	40.3%	46.2%	47.9%

[1]All ratios are based on 'Adjusted' financial data and incorporate Moody's Global Standard Adjustments for Non-Financial Corporations.
Source: Moody's Financial Metrics

Profile

Consolidated Edison Company of New York, Inc. (CECONY, A3 stable) is the anchor subsidiary of Consolidated Edison, Inc. (CEI, Baa1 stable), which also owns Orange and Rockland Utilities, Inc. (O&R, Baa1 stable). CECONY is the largest US transmission and distribution (T&D) utility, serving 3.4 million electric, 1.1 million gas, and 1,600 steam customers in New York City and Westchester County. CECONY's electric operations account for about 75% of the company's operating income, gas represents another 19% of operating income, while steam makes up the remaining 6%. The exhibit below depicts our forward view of EBITDA contribution of each of these segments, based on current rate plans.

Exhibit 3
Electric operations drive the majority of CECONY's EBITDA generation.



Source: Moody's Investors Service

Detailed credit considerations

Regulatory environment provides strong support for timely cost recovery

CECONY's credit is based on its low business risk as a T&D utility and the stabilizing features of the regulatory support provided by its principal regulator, the New York State Public Service Commission (NYPSC). The New York regulatory framework has a number of credit-positive features, including the allowance of a future test year in calculating revenue requirements, multi-year rate plans and the use of full revenue decoupling for both electric and gas services (and weather normalization for gas). These features enhance the timeliness of cost recovery, provide visibility into future financial performance and protect utility margins from variations in sales volumes.

Beyond the financial implications of multi-year rate plans, we also view multi-party settlements (which CECNOY has been successful in achieving in the past) as a significant positive because it offers clear evidence of cooperation between the utility, the NYPSC staff, and key customers. This collaborative relationship is essential for CECONY to maintain a stable and predictable financial profile, especially as various energy initiatives throughout the state develop.

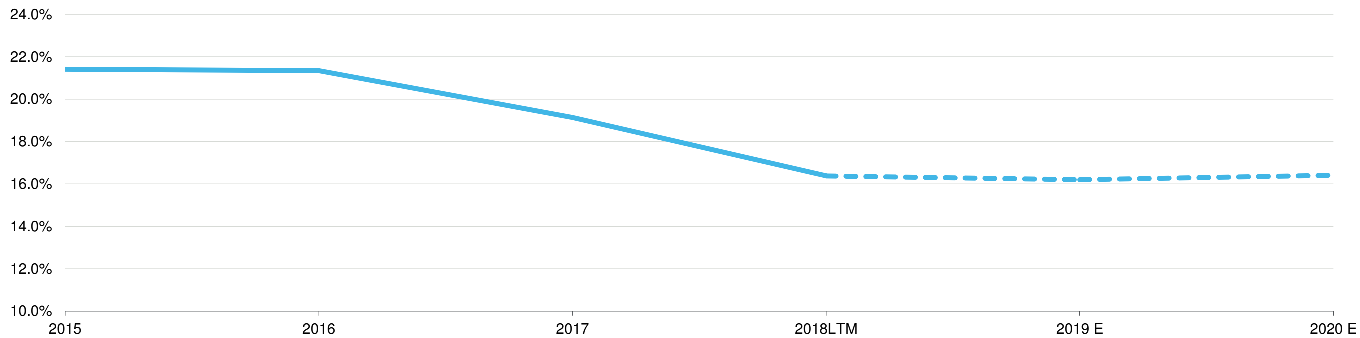
Cash flow headwinds from tax reform will offset some benefit from upcoming rate increases

We expect that CECONY will file for another multi-year rate plan in the coming months, since its current 3-year plan will expire by year-end 2019. The utility will seek recovery on a sizeable amount of regulatory assets (e.g., nearly $3.8 billion were on the balance sheet as of June 2018) and increasing capital expenditures to address infrastructure resiliency, energy efficiency and other New York policy priorities. However, the impacts of federal tax reform will offset some of the revenue and cash flow increases that we would otherwise expect CECONY to receive from this filing.

In August, CECONY received some clarity on rate treatment of tax reform via a New York Public Service Commission (NYPSC) order, which includes sur-credits for electric and gas revenue in 2019 and amortization of accumulated deferred tax benefits to be determined in an upcoming general rate case. CECONY's excess deferred tax balance is sizeable, including around $2.5 billion of "protected" liabilities that will be returned to customers over multiple decades and about $971 million of "unprotected" liabilities that the company has proposed to return over five years. These amounts are in addition to lower cash flow generated by ongoing deferred taxes from a lower revenue requirement.

As such, we expect CECONY's cash flow to remain steady, at the same time that the utility's capital spending – and debt - is expected to increase. The combination will result in CECONY cash flow to debt ratios around 16-17%, as depicted in the graph below.

Exhibit 4
CECONY's historical and forecast CFO Pre-WC to debt



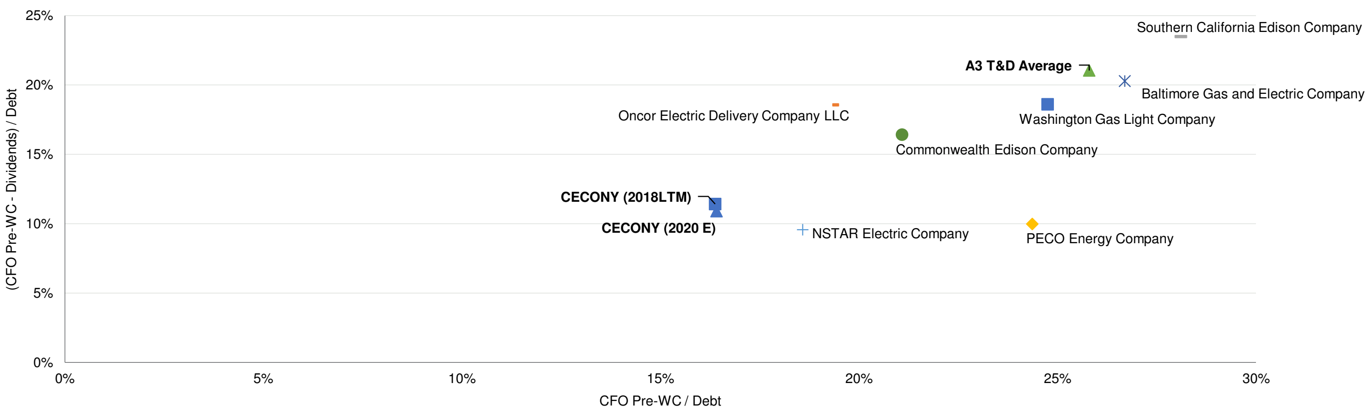
Source: Moody's Investors Service projections

High levels of capital spending, dividends and increasing debt will result in little financial flexibility versus peers

CECONY expects to spend around $3.0 billion in annual capital expenditures through 2020. We expect that the majority of its capital financing will come from debt, in order to keep its capital structure in-line with the 52/48 debt/equity that the NYPSC currently allows in rates. This level of cash outlay, coupled with high dividend payout levels (e.g., 71% through LTM 2Q18) will likely pressure financial metrics, given the stagnant cash flow generation owed to tax reform.

As such, we see limited financial flexibility for the utility given its current credit profile. The exhibit below compares where we see prospective CECONY cash flow ratios versus similarly rated peers and other large, urban-based T&Ds through LTM 2Q18.

Exhibit 5
CECONY's credit metrics compared to selected urban-located T&D peers



Source: Moody's Investors Service

Long-term operational changes to accommodate changing customer and regulatory preferences

Under the State of New York's Reforming the Energy Vision Initiative (REV, a proceeding that began in 2014 to promote clean energy, energy efficiency, and distributed generation throughout the state), CECONY will be required to adapt planning and operations to accommodate changing customer and regulatory demands for clean and efficient energy delivery. Rather than relying solely on the traditional utility-lead resource procurement and infrastructure rate base build, CECONY will have to be increasingly responsive to customer supply preferences (e.g., infrastructure that supports distributed and renewable generation), incorporate complex benefit/cost analysis to investment approval processes, and adopt new rate design features that compensate the utility in new ways.

While the exact form of implementation is still evolving, it appears that the foundational policy framework for expense recovery and regulated returns has largely been preserved - a credit positive. So far, the REV process has been benign to credit and we view the NYPSC's proactive and inclusive approach to policy reforms as positive. However, it would be negative to CECONY's credit if the evolution of REV results in a preponderance of market-oriented revenue that drifts from the cost recovery provisions currently underpinning the utility's credit profile.

Moderate carbon transition risk as a holding company of T&D and renewable generation assets

CECONY has moderate carbon transition risk within the utility sector because it is a T&D utility with no generation ownership. All commodity costs, including carbon, associated with power procurement for customers are fully passed through to the customers with an effective cost recovery mechanism. Moody's framework for assessing carbon transition risk in this industry is set out in "Prudent regulation key to mitigating risk, capturing opportunities of decarbonization" (2 Nov 2017).

Liquidity analysis

CECONY's high capex of around $3.0 billion and dividends assumed to be in the $750 - $850 million range will exceed cash flow from operations of approximately $3.0 billion over the next twelve months. Therefore, CECONY will rely on external liquidity resources for short-term needs which will bridge the company to longer-term financing in the capital markets.

In terms of external liquidity, CECONY, affiliate O&R, and CEI are co-borrowers under a credit facility with $2.25 billion committed through December 2022. CECONY is entitled to access the full $2.25 billion, while CEI and O&R are limited to $1.0 billion and $200 million, respectively. The credit facility provides a backstop to the CP programs at each of CEI, CECONY, and O&R which are sized to their respective sub-limits under the revolver. As of 30 June 2018, CEI holding company had around $869 million of which CECONY had $550 million of commercial paper outstanding, leaving about $1.4 billion available under its credit facility.

This credit agreement does not require the companies to represent and warrant as to material adverse change, litigation or full disclosure that would restrict access to the facility. It contains a single financial covenant which limits each borrower's Debt/Capitalization to 65%, which CECONY was in compliance with at 30 June 2018.

CECONY's next long-term debt maturities include $600 million due in December 2018 and $475 million due in April 2019. In addition, the company is the obligor for $450 million of variable-rate demand facilities revenue bonds issued by the New York State Energy Research and Development Authority. Each of these demand obligations is supported by its own letter of credit in case the bondholder opts to put it back to CECONY.

Rating methodology and scorecard factors

Exhibit 6

Rating Factors				
Consolidated Edison Company of New York, Inc.				
Regulated Electric and Gas Utilities Industry Grid [1][2]	**Current LTM 6/30/2018**		**Moody's 12-18 Month Forward View As of Date Published [3]**	
Factor 1 : Regulatory Framework (25%)	**Measure**	**Score**	**Measure**	**Score**
a) Legislative and Judicial Underpinnings of the Regulatory Framework	A	A	A	A
b) Consistency and Predictability of Regulation	A	A	A	A
Factor 2 : Ability to Recover Costs and Earn Returns (25%)				
a) Timeliness of Recovery of Operating and Capital Costs	Aa	Aa	Aa	Aa
b) Sufficiency of Rates and Returns	Baa	Baa	Baa	Baa
Factor 3 : Diversification (10%)				
a) Market Position	Aa	Aa	Aa	Aa
b) Generation and Fuel Diversity	N/A	N/A	N/A	N/A
Factor 4 : Financial Strength (40%)				
a) CFO pre-WC + Interest / Interest (3 Year Avg)	5.4x	A	4.4x - 4.8x	A
b) CFO pre-WC / Debt (3 Year Avg)	19.3%	A	14% - 17%	Baa
c) CFO pre-WC – Dividends / Debt (3 Year Avg)	14.3%	Baa	10% - 13%	Baa
d) Debt / Capitalization (3 Year Avg)	43.8%	A	44% - 48%	A
Rating:				
Grid-Indicated Rating Before Notching Adjustment		A2		A3
HoldCo Structural Subordination Notching	0	0		0
a) Indicated Rating from Grid		A2		A3
b) Actual Rating Assigned		A2		A3

[1]All ratios are based on 'Adjusted' financial data and incorporate Moody's Global Standard Adjustments for Non-Financial Corporations.
[2]As of 6/30/2018(L);
[3]This represents Moody's forward view; not the view of the issuer; and unless noted in the text, does not incorporate significant acquisitions and divestitures.
Source: Moody's Financial Metrics

Appendix

Exhibit 7

Cash Flow and Credit Metrics [1]

CF Metrics	Dec-14	Dec-15	Dec-16	Dec-17	LTM Jun-18
As Adjusted					
FFO	**2,458**	**2,479**	**2,449**	**2,696**	**2,657**
+/- Other	752	731	601	196	54
CFO Pre-WC	3,210	3,210	3,050	2,892	2,711
+/- ΔWC	(446)	38	207	175	(223)
CFO	**2,764**	**3,248**	**3,257**	**3,067**	**2,488**
- Div	712	872	744	796	821
- Capex	2,314	2,633	2,883	3,115	3,282
FCF	**(262)**	**(257)**	**(370)**	**(844)**	**(1,615)**
(CFO Pre-W/C) / Debt	21.4%	21.4%	21.3%	19.1%	16.4%
(CFO Pre-W/C - Dividends) / Debt	16.6%	15.6%	16.1%	13.9%	11.4%
FFO / Debt	16.4%	16.5%	17.1%	17.8%	16.1%
RCF / Debt	11.6%	10.7%	11.9%	12.6%	11.1%
Revenue	10,786	10,328	10,165	10,468	10,541
EBITDA	3,489	3,730	3,608	3,841	3,795
Net PP&E	29,957	32,374	35,396	37,780	38,947
Total Debt	15,021	14,991	14,294	15,114	16,554

[1] All figures & ratios calculated using Moody's estimates & standard adjustments. Periods are Financial Year-End unless indicated. LTM = Last Twelve Months.
Source: Moody's Financial Metrics

Exhibit 8

Peer Comparison Table [1]

	Consolidated Edison Company of New York, Inc. A3 Stable			Public Service Electric and Gas Company A2 Stable			Commonwealth Edison Company A3 Stable			Niagara Mohawk Power Corporation A2 Negative			FortisAlberta Inc. Baa1 Stable		
(in US millions)	FYE Dec-16	FYE Dec-17	LTM Jun-18	FYE Dec-16	FYE Dec-17	LTM Jun-18	FYE Dec-16	FYE Dec-17	LTM Jun-18	FYE Mar-16	FYE Mar-17	FYE Mar-18	FYE Dec-16	FYE Dec-17	LTM Mar-18
Revenue	10,165	10,468	10,541	6,221	6,234	6,246	5,254	5,536	5,791	2,858	2,849	3,040	432	463	481
CFO Pre-W/C	3,050	2,892	2,711	1,719	1,802	1,748	1,897	2,190	2,001	639	694	735	226	205	233
Total Debt	14,294	15,114	16,554	8,217	8,979	9,402	8,605	9,094	9,492	2,995	2,994	2,991	1,447	1,674	1,673
CFO Pre-W/C / Debt	21.3%	19.1%	16.4%	20.9%	20.1%	18.6%	22.0%	24.1%	21.1%	21.3%	23.2%	24.6%	15.4%	12.7%	13.5%
CFO Pre-W/C – Dividends / Debt	16.1%	13.9%	11.4%	20.9%	20.1%	18.6%	17.7%	19.4%	16.4%	21.3%	23.1%	6.2%	8.3%	9.6%	10.4%
Debt / Capitalization	40.3%	46.2%	47.9%	36.2%	40.7%	40.4%	37.9%	41.2%	41.4%	31.9%	31.1%	35.7%	56.1%	56.3%	56.4%

[1] All figures & ratios calculated using Moody's estimates & standard adjustments. FYE = Financial Year End. LTM = Last Twelve Months. RUR* = Ratings under Review, where UPG = for upgrade and DNG = for downgrade
Source: Moody's Financial Metrics

Ratings

Exhibit 9

Category	Moody's Rating
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.	
Outlook	Stable
Issuer Rating	A3
Senior Unsecured	A3
Commercial Paper	P-2
PARENT: CONSOLIDATED EDISON, INC.	
Outlook	Stable
Issuer Rating	Baa1
Senior Unsecured	Baa1
Commercial Paper	P-2

Source: Moody's Investors Service

REPORT NUMBER 1147268

CLIENT SERVICES

Americas	1-212-553-1653
Asia Pacific	852-3551-3077
Japan	81-3-5408-4100
EMEA	44-20-7772-5454

Net Fixed Assets to Revenues
Last Twelve Months as of 12/31/17
For S&P 500 Constituents

Rank	Percentile	Company	2017 Net Fixed Assets / Revenues
1	100%	REALTY INCOME CORP	10.4x
2	100%	REGENCY CENTERS CORP	9.7x
3	99%	ALEXANDRIA REAL ESTATE EQUIT	9.2x
4	99%	KIMCO REALTY CORP	8.7x
5	99%	PROLOGIS INC	8.3x
6	99%	AVALONBAY COMMUNITIES INC	8.2x
7	99%	EQUITY RESIDENTIAL	8.1x
8	98%	ESSEX PROPERTY TRUST INC	8.0x
9	98%	DUKE REALTY CORP	7.7x
10	98%	MID-AMERICA APARTMENT COMM	7.3x
11	98%	MACERICH CO/THE	7.2x
12	97%	UDR INC	6.9x
13	97%	FEDERAL REALTY INVS TRUST	6.7x
14	97%	EXTRA SPACE STORAGE INC	6.5x
15	97%	BOSTON PROPERTIES INC	6.3x
16	97%	DIAMONDBACK ENERGY INC	6.1x
17	96%	HCP INC	5.8x
18	96%	VENTAS INC	5.8x
19	96%	VORNADO REALTY TRUST	5.7x
20	96%	DIGITAL REALTY TRUST INC	5.6x
21	96%	WELLTOWER INC	5.4x
22	95%	APARTMENT INVT & MGMT CO -A	5.4x
23	95%	SL GREEN REALTY CORP	5.2x
24	95%	CONCHO RESOURCES INC	4.9x
25	95%	AMERICAN WATER WORKS CO INC	4.8x
26	95%	PPL CORP	4.4x
27	94%	SIMON PROPERTY GROUP INC	4.4x
28	94%	NOBLE ENERGY INC	4.3x
29	94%	DOMINION ENERGY INC	4.3x
30	94%	NEXTERA ENERGY INC	4.2x
31	93%	MARATHON OIL CORP	4.0x
32	93%	PINNACLE WEST CAPITAL	3.7x
33	93%	DUKE ENERGY CORP	3.7x
34	93%	WILLIAMS COS INC	3.5x
35	93%	PUBLIC SERVICE ENTERPRISE GP	3.5x
36	92%	AMEREN CORPORATION	3.5x
37	92%	SOUTHERN CO/THE	3.5x
38	92%	PUBLIC STORAGE	3.5x
39	92%	ALLIANT ENERGY CORP	3.3x
40	92%	AMERICAN ELECTRIC POWER	3.3x

Source: Bloomberg and CEI 2017 Form 10-K.

Net Fixed Assets to Revenues
Last Twelve Months as of 12/31/17
For S&P 500 Constituents

Rank	Percentile	Company	2017 Net Fixed Assets / Revenues
41	91%	SEMPRA ENERGY	3.3x
42	91%	KANSAS CITY SOUTHERN	3.3x
43	91%	EDISON INTERNATIONAL	3.2x
44	91%	P G & E CORP	3.1x
45	**91%**	**CONSOLIDATED EDISON INC**	**3.1x**
46	90%	EVERSOURCE ENERGY	3.0x
47	90%	APACHE CORP	3.0x
48	90%	XCEL ENERGY INC	3.0x
49	90%	CROWN CASTLE INTL CORP	3.0x
50	89%	HESS CORP	3.0x
51	89%	NISOURCE INC	2.9x
52	89%	KINDER MORGAN INC	2.9x
53	89%	NORFOLK SOUTHERN CORP	2.9x
54	89%	WEC ENERGY GROUP INC	2.8x
55	88%	CSX CORP	2.8x
56	88%	ENTERGY CORP	2.7x
57	88%	CMS ENERGY CORP	2.5x
58	88%	PIONEER NATURAL RESOURCES CC	2.5x
59	88%	OCCIDENTAL PETROLEUM CORP	2.5x
60	87%	UNION PACIFIC CORP	2.4x
61	87%	ANADARKO PETROLEUM CORP	2.3x
62	87%	EOG RESOURCES INC	2.3x
63	87%	NEWFIELD EXPLORATION CO	2.3x
64	87%	ROYAL CARIBBEAN CRUISES LTD	2.2x
65	86%	CF INDUSTRIES HOLDINGS INC	2.2x
66	86%	EXELON CORP	2.2x
67	86%	EQUINIX INC	2.2x
68	86%	FIRSTENERGY CORP	2.1x
69	85%	NORWEGIAN CRUISE LINE HOLDIN	2.0x
70	85%	HELMERICH & PAYNE	2.0x
71	85%	AES CORP	1.9x
72	85%	CARNIVAL CORP	1.9x
73	85%	MGM RESORTS INTERNATIONAL	1.8x
74	84%	CIMAREX ENERGY CO	1.8x
75	84%	HOST HOTELS & RESORTS INC	1.8x
76	84%	CABOT OIL & GAS CORP	1.8x
77	84%	NEWMONT MINING CORP	1.7x
78	84%	AMERICAN TOWER CORP	1.7x
79	83%	DTE ENERGY COMPANY	1.6x
80	83%	SBA COMMUNICATIONS CORP	1.6x

Source: Bloomberg and CEI 2017 Form 10-K.

Net Fixed Assets to Revenues
Last Twelve Months as of 12/31/17
For S&P 500 Constituents

Rank	Percentile	Company	2017 Net Fixed Assets / Revenues
81	83%	CONOCOPHILLIPS	1.6x
82	83%	CENTURYLINK INC	1.5x
83	83%	DEVON ENERGY CORP	1.5x
84	82%	CHEVRON CORP	1.4x
85	82%	FREEPORT-MCMORAN INC	1.4x
86	82%	CORNING INC	1.4x
87	82%	CENTERPOINT ENERGY INC	1.4x
88	81%	WYNN RESORTS LTD	1.3x
89	81%	MOSAIC CO/THE	1.3x
90	81%	NRG ENERGY INC	1.3x
91	81%	LOEWS CORP	1.1x
92	81%	AIR PRODUCTS & CHEMICALS INC	1.1x
93	80%	LINDE PLC	1.1x
94	80%	EXXON MOBIL CORP	1.1x
95	80%	ONEOK INC	1.0x
96	80%	VULCAN MATERIALS CO	1.0x
97	80%	MCDONALD'S CORP	1.0x
98	79%	MARTIN MARIETTA MATERIALS	0.9x
99	79%	IRON MOUNTAIN INC	0.9x
100	79%	SOUTHWEST AIRLINES CO	0.9x
101	79%	CHARTER COMMUNICATIONS INC-A	0.8x
102	79%	ALBEMARLE CORP	0.8x
103	78%	AMERICAN AIRLINES GROUP INC	0.8x
104	78%	WASTE MANAGEMENT INC	0.8x
105	78%	ALASKA AIR GROUP INC	0.8x
106	78%	AT&T INC	0.8x
107	77%	MICRON TECHNOLOGY INC	0.8x
108	77%	REPUBLIC SERVICES INC	0.8x
109	77%	VERIZON COMMUNICATIONS INC	0.7x
110	77%	UNITED CONTINENTAL HOLDINGS	0.7x
111	77%	BERKSHIRE HATHAWAY INC-CL B	0.7x
112	76%	COPART INC	0.6x
113	76%	DELTA AIR LINES INC	0.6x
114	76%	CONSTELLATION BRANDS INC-A	0.6x
115	76%	INTERNATIONAL PAPER CO	0.6x
116	76%	CELANESE CORP	0.6x
117	75%	EASTMAN CHEMICAL CO	0.6x
118	75%	WESTROCK CO	0.6x
119	75%	WALT DISNEY CO/THE	0.5x
120	75%	GOODYEAR TIRE & RUBBER CO	0.5x

Source: Bloomberg and CEI 2017 Form 10-K.

Net Fixed Assets to Revenues
Last Twelve Months as of 12/31/17
For S&P 500 Constituents

Rank	Percentile	Company	2017 Net Fixed Assets / Revenues
121	75%	QORVO INC	0.5x
122	74%	DOWDUPONT INC	0.5x
123	74%	COMCAST CORP-CLASS A	0.5x
124	74%	PACKAGING CORP OF AMERICA	0.5x
125	74%	MOHAWK INDUSTRIES INC	0.4x
126	73%	GENERAL ELECTRIC CO	0.4x
127	73%	UNIVERSAL HEALTH SERVICES-B	0.4x
128	73%	BAXTER INTERNATIONAL INC	0.4x
129	73%	ARCONIC INC	0.4x
130	73%	FEDEX CORP	0.4x
131	72%	MOLSON COORS BREWING CO -B	0.4x
132	72%	BALL CORP	0.4x
133	72%	LAMB WESTON HOLDINGS INC	0.4x
134	72%	HUNT (JB) TRANSPRT SVCS INC	0.4x
135	72%	HALLIBURTON CO	0.4x
136	71%	NATIONAL OILWELL VARCO INC	0.4x
137	71%	HCA HEALTHCARE INC	0.4x
138	71%	KIMBERLY-CLARK CORP	0.4x
139	71%	KOHLS CORP	0.4x
140	71%	BAKER HUGHES A GE CO	0.4x
141	70%	REGENERON PHARMACEUTICALS	0.4x
142	70%	ZIONS BANCORPORATION	0.4x
143	70%	MARATHON PETROLEUM CORP	0.4x
144	70%	ELI LILLY & CO	0.4x
145	69%	COOPER COS INC/THE	0.4x
146	69%	ALPHABET INC-CL C	0.4x
147	69%	ALPHABET INC-CL A	0.4x
148	69%	SCHLUMBERGER LTD	0.4x
149	69%	AUTOZONE INC	0.4x
150	68%	ALEXION PHARMACEUTICALS INC	0.4x
151	68%	O'REILLY AUTOMOTIVE INC	0.4x
152	68%	CAMPBELL SOUP CO	0.4x
153	68%	TARGET CORP	0.4x
154	68%	GOLDMAN SACHS GROUP INC	0.4x
155	67%	FMC CORP	0.4x
156	67%	DEERE & CO	0.3x
157	67%	AKAMAI TECHNOLOGIES INC	0.3x
158	67%	FIFTH THIRD BANCORP	0.3x
159	67%	REGIONS FINANCIAL CORP	0.3x
160	66%	ILLUMINA INC	0.3x

Source: Bloomberg and CEI 2017 Form 10-K.

Net Fixed Assets to Revenues
Last Twelve Months as of 12/31/17
For S&P 500 Constituents

Rank	Percentile	Company	2017 Net Fixed Assets / Revenues
161	66%	FACEBOOK INC-A	0.3x
162	66%	BECTON DICKINSON AND CO	0.3x
163	66%	UNITED PARCEL SERVICE-CL B	0.3x
164	65%	MONDELEZ INTERNATIONAL INC-A	0.3x
165	65%	HOLLYFRONTIER COPR	0.3x
166	65%	MICROSOFT CORP	0.3x
167	65%	IPG PHOTONICS CORP	0.3x
168	65%	LYONDELLBASELL INDU-CL A	0.3x
169	64%	VERTEX PHARMACEUTICALS INC	0.3x
170	64%	TWITTER INC	0.3x
171	64%	CATERPILLAR INC	0.3x
172	64%	VALERO ENERGY CORP	0.3x
173	64%	MERCK & CO. INC.	0.3x
174	63%	PROCTER & GAMBLE CO/THE	0.3x
175	63%	PNC FINANCIAL SERVICES GROUP	0.3x
176	63%	DARDEN RESTAURANTS INC	0.3x
177	63%	CHIPOTLE MEXICAN GRILL INC	0.3x
178	63%	HUNTINGTON INGALLS INDUSTRIE	0.3x
179	62%	SKYWORKS SOLUTIONS INC	0.3x
180	62%	BORGWARNER INC	0.3x
181	62%	DAVITA INC	0.3x
182	62%	YUM! BRANDS INC	0.3x
183	61%	LOWE'S COS INC	0.3x
184	61%	NEWS CORP - CLASS B	0.3x
185	61%	NEWS CORP - CLASS A	0.3x
186	61%	HERSHEY CO/THE	0.3x
187	61%	3M CO	0.3x
188	60%	ABBOTT LABORATORIES	0.3x
189	60%	AMAZON.COM INC	0.3x
190	60%	ZOETIS INC	0.3x
191	60%	INTERCONTINENTAL EXCHANGE IN	0.3x
192	60%	MACY'S INC	0.3x
193	59%	ECOLAB INC	0.3x
194	59%	PFIZER INC	0.3x
195	59%	COLGATE-PALMOLIVE CO	0.3x
196	59%	ZIMMER BIOMET HOLDINGS INC	0.3x
197	59%	BIOGEN INC	0.3x
198	58%	INTL FLAVORS & FRAGRANCES	0.3x
199	58%	TECHNIPFMC PLC	0.3x
200	58%	GENERAL MILLS INC	0.3x

Source: Bloomberg and CEI 2017 Form 10-K.

Net Fixed Assets to Revenues
Last Twelve Months as of 12/31/17
For S&P 500 Constituents

Rank	Percentile	Company	2017 Net Fixed Assets / Revenues
201	58%	WEYERHAEUSER CO	0.3x
202	57%	KEYCORP	0.3x
203	57%	NORDSTROM INC	0.3x
204	57%	PHILIP MORRIS INTERNATIONAL	0.3x
205	57%	NUCOR CORP	0.3x
206	57%	TE CONNECTIVITY LTD	0.3x
207	56%	GENERAL MOTORS CO	0.2x
208	56%	METTLER-TOLEDO INTERNATIONAL	0.2x
209	56%	BRISTOL-MYERS SQUIBB CO	0.2x
210	56%	PHILLIPS 66	0.2x
211	56%	BROWN-FORMAN CORP-CLASS B	0.2x
212	55%	STARBUCKS CORP	0.2x
213	55%	TIFFANY & CO	0.2x
214	55%	ALIGN TECHNOLOGY INC	0.2x
215	55%	JM SMUCKER CO/THE	0.2x
216	55%	MAXIM INTEGRATED PRODUCTS INC	0.2x
217	54%	COCA-COLA CO/THE	0.2x
218	54%	WAL-MART STORES INC	0.2x
219	54%	L BRANDS INC	0.2x
220	54%	VERISIGN INC	0.2x
221	53%	FORD MOTOR CO	0.2x
222	53%	SEALED AIR CORP	0.2x
223	53%	VERISK ANALYTICS INC	0.2x
224	53%	JOHNSON & JOHNSON	0.2x
225	53%	DENTSPLY SIRONA INC	0.2x
226	52%	HOME DEPOT INC	0.2x
227	52%	AMGEN INC	0.2x
228	52%	APTIV PLC	0.2x
229	52%	CINTAS CORP	0.2x
230	52%	EMERSON ELECTRIC CO	0.2x
231	51%	CONAGRA BRANDS INC	0.2x
232	51%	FASTENAL CO	0.2x
233	51%	JUNIPER NETWORKS INC	0.2x
234	51%	ULTA BEAUTY INC	0.2x
235	51%	HEWLETT PACKARD ENTERPRISE	0.2x
236	50%	EDWARDS LIFESCIENCES CORP	0.2x
237	50%	ABIOMED INC	0.2x
238	50%	JOHNSON CONTROLS INTERNATION	0.2x
239	50%	MYLAN NV	0.2x
240	49%	INTUITIVE SURGICAL INC	0.2x

Source: Bloomberg and CEI 2017 Form 10-K.

Net Fixed Assets to Revenues
Last Twelve Months as of 12/31/17
For S&P 500 Constituents

Rank	Percentile	Company	2017 Net Fixed Assets / Revenues
241	49%	THERMO FISHER SCIENTIFIC INC	0.2x
242	49%	MICROCHIP TECHNOLOGY INC	0.2x
243	49%	IDEXX LABORATORIES INC	0.2x
244	49%	CUMMINS INC	0.2x
245	48%	RALPH LAUREN CORP	0.2x
246	48%	PPG INDUSTRIES INC	0.2x
247	48%	WHIRLPOOL CORP	0.2x
248	48%	BOSTON SCIENTIFIC CORP	0.2x
249	48%	JACK HENRY & ASSOCIATES INC	0.2x
250	47%	ANALOG DEVICES INC	0.2x
251	47%	SALESFORCE.COM INC	0.2x
252	47%	STATE STREET CORP	0.2x
253	47%	FLOWSERVE CORP	0.2x
254	47%	HUNTINGTON BANCSHARES INC	0.2x
255	46%	COTY INC-CL A	0.2x
256	46%	TEXAS INSTRUMENTS INC	0.2x
257	46%	SUNTRUST BANKS INC	0.2x
258	46%	UNDER ARMOUR INC-CLASS C	0.2x
259	45%	UNDER ARMOUR INC-CLASS A	0.2x
260	45%	GAP INC/THE	0.2x
261	45%	SMITH (A.O.) CORP	0.2x
262	45%	KROGER CO	0.2x
263	45%	EATON CORP PLC	0.2x
264	44%	HARLEY-DAVIDSON INC	0.2x
265	44%	UNITED TECHNOLOGIES CORP	0.2x
266	44%	INCYTE CORP	0.2x
267	44%	BB&T CORP	0.2x
268	44%	TRIPADVISOR INC	0.2x
269	43%	EQUIFAX INC	0.2x
270	43%	ROSS STORES INC	0.2x
271	43%	PERRIGO CO PLC	0.2x
272	43%	LEGGETT & PLATT INC	0.2x
273	43%	LABORATORY CRP OF AMER HLDGS	0.2x
274	42%	AGILENT TECHNOLOGIES INC	0.2x
275	42%	EBAY INC	0.2x
276	42%	ARCHER-DANIELS-MIDLAND CO	0.2x
277	42%	RESMED INC	0.2x
278	41%	NASDAQ INC	0.2x
279	41%	SCHWAB (CHARLES) CORP	0.2x
280	41%	FORTINET INC	0.2x

Source: Bloomberg and CEI 2017 Form 10-K.

Net Fixed Assets to Revenues
Last Twelve Months as of 12/31/17
For S&P 500 Constituents

Rank	Percentile	Company	2017 Net Fixed Assets / Revenues
281	41%	NORTHROP GRUMMAN CORP	0.2x
282	41%	CLOROX COMPANY	0.2x
283	40%	SYMANTEC CORP	0.2x
284	40%	CHURCH & DWIGHT CO INC	0.2x
285	40%	MATTEL INC	0.2x
286	40%	SEAGATE TECHNOLOGY	0.2x
287	40%	STRYKER CORP	0.2x
288	39%	HORMEL FOODS CORP	0.2x
289	39%	EXPEDIA INC	0.2x
290	39%	CARMAX INC	0.2x
291	39%	APPLE INC	0.2x
292	39%	NEKTAR THERAPEUTICS	0.2x
293	38%	TYSON FOODS INC-CL A	0.2x
294	38%	MEDTRONIC PLC	0.2x
295	38%	PEOPLE'S UNITED FINANCIAL	0.2x
296	38%	DISH NETWORK CORP-A	0.2x
297	37%	WATERS CORP	0.2x
298	37%	TAPESTRY INC	0.2x
299	37%	WESTERN DIGITAL CORP	0.1x
300	37%	HOLOGIC INC	0.1x
301	37%	QUEST DIAGNOSTICS INC	0.1x
302	36%	DXC TECHNOLOGY CO	0.1x
303	36%	ORACLE CORP	0.1x
304	36%	GLOBAL PAYMENTS INC	0.1x
305	36%	MASCO CORP	0.1x
306	36%	FLIR SYSTEMS INC	0.1x
307	35%	HONEYWELL INTERNATIONAL INC	0.1x
308	35%	HARRIS CORP	0.1x
309	35%	IHS MARKIT LTD	0.1x
310	35%	DOLLAR TREE INC	0.1x
311	35%	KEYSIGHT TECHNOLOGIES INC	0.1x
312	34%	COMERICA INC	0.1x
313	34%	INTL BUSINESS MACHINES CORP	0.1x
314	34%	FORTUNE BRANDS HOME & SECURI	0.1x
315	34%	TJX COMPANIES INC	0.1x
316	33%	COSTCO WHOLESALE CORP	0.1x
317	33%	XYLEM INC	0.1x
318	33%	INTUIT INC	0.1x
319	33%	QUANTA SERVICES INC	0.1x
320	33%	T ROWE PRICE GROUP INC	0.1x

Source: Bloomberg and CEI 2017 Form 10-K.

Net Fixed Assets to Revenues
Last Twelve Months as of 12/31/17
For S&P 500 Constituents

Rank	Percentile	Company	2017 Net Fixed Assets / Revenues
321	32%	BOEING CO/THE	0.1x
322	32%	CAPITAL ONE FINANCIAL CORP	0.1x
323	32%	MOTOROLA SOLUTIONS INC	0.1x
324	32%	DANAHER CORP	0.1x
325	32%	WW GRAINGER INC	0.1x
326	31%	ESTEE LAUDER COMPANIES-CL A	0.1x
327	31%	PERKINELMER INC	0.1x
328	31%	QUALCOMM INC	0.1x
329	31%	PARKER HANNIFIN CORP	0.1x
330	31%	NETAPP INC	0.1x
331	30%	DOVER CORP	0.1x
332	30%	PACCAR INC	0.1x
333	30%	BROADCOM LTD	0.1x
334	30%	GILEAD SCIENCES INC	0.1x
335	29%	SHERWIN-WILLIAMS CO/THE	0.1x
336	29%	JPMORGAN CHASE & CO	0.1x
337	29%	ILLINOIS TOOL WORKS	0.1x
338	29%	CAPRI HOLDINGS	0.1x
339	29%	NIKE INC -CL B	0.1x
340	28%	AMERICAN EXPRESS CO	0.1x
341	28%	WILLIS TOWERS WATSON PLC	0.1x
342	28%	VISA INC-CLASS A SHARES	0.1x
343	28%	XILINX INC	0.1x
344	28%	ADOBE SYSTEMS INC	0.1x
345	27%	PAYPAL HOLDINGS INC	0.1x
346	27%	AMPHENOL CORP-CL A	0.1x
347	27%	PAYCHEX INC	0.1x
348	27%	L3 TECHNOLOGIES INC	0.1x
349	27%	NEWELL BRANDS INC	0.1x
350	26%	DOLLAR GENERAL CORP	0.1x
351	26%	AMETEK INC	0.1x
352	26%	GENERAL DYNAMICS CORP	0.1x
353	26%	LOCKHEED MARTIN CORP	0.1x
354	25%	ALLERGAN PLC	0.1x
355	25%	FOOT LOCKER INC	0.1x
356	25%	PENTAIR PLC	0.1x
357	25%	CME GROUP INC	0.1x
358	25%	INGERSOLL-RAND PLC	0.1x
359	24%	M & T BANK CORP	0.1x
360	24%	FORTIVE CORP	0.1x

Source: Bloomberg and CEI 2017 Form 10-K.

Net Fixed Assets to Revenues
Last Twelve Months as of 12/31/17
For S&P 500 Constituents

Rank	Percentile	Company	2017 Net Fixed Assets / Revenues
361	24%	CITIZENS FINANCIAL GROUP	0.1x
362	24%	WALGREENS BOOTS ALLIANCE INC	0.1x
363	24%	XEROX CORP	0.1x
364	23%	ALLEGION PLC	0.1x
365	23%	E*TRADE FINANCIAL CORP	0.1x
366	23%	NVIDIA CORP	0.1x
367	23%	TRANSDIGM GROUP INC	0.1x
368	23%	FIRST REPUBLIC BANK	0.1x
369	22%	US BANCORP	0.1x
370	22%	PVH CORP	0.1x
371	22%	ABBVIE INC	0.1x
372	22%	SYNOPSYS INC	0.1x
373	21%	BANK OF NEW YORK MELLON CORP	0.1x
374	21%	ALTRIA GROUP INC	0.1x
375	21%	RAYTHEON COMPANY	0.1x
376	21%	INVESCO LTD	0.1x
377	21%	VARIAN MEDICAL SYSTEMS INC	0.1x
378	20%	LKQ CORP	0.1x
379	20%	CBS CORP-CLASS B NON VOTING	0.1x
380	20%	BANK OF AMERICA CORP	0.1x
381	20%	WELLS FARGO & CO	0.1x
382	20%	CITRIX SYSTEMS INC	0.1x
383	19%	COGNIZANT TECH SOLUTIONS-A	0.1x
384	19%	ELECTRONIC ARTS INC	0.1x
385	19%	DISCOVERY COMMUNICATIONS-A	0.1x
386	19%	DISCOVERY COMMUNICATIONS-C	0.1x
387	19%	ROCKWELL AUTOMATION INC	0.1x
388	18%	FRANKLIN RESOURCES INC	0.1x
389	18%	INTERPUBLIC GROUP OF COS INC	0.1x
390	18%	CELGENE CORP	0.1x
391	18%	APPLIED MATERIALS INC	0.1x
392	17%	LAM RESEARCH CORP	0.1x
393	17%	NORTHERN TRUST CORP	0.1x
394	17%	ROLLINS INC	0.1x
395	17%	FLEETCOR TECHNOLOGIES INC	0.1x
396	17%	ALLIANCE DATA SYSTEMS CORP	0.1x
397	16%	CBOE GLOBAL MARKETS INC	0.1x
398	16%	MARRIOTT INTERNATIONAL -CL A	0.1x
399	16%	MOODY'S CORP	0.1x
400	16%	SYSCO CORP	0.1x

Source: Bloomberg and CEI 2017 Form 10-K.

Net Fixed Assets to Revenues
Last Twelve Months as of 12/31/17
For S&P 500 Constituents

Rank	Percentile	Company	2017 Net Fixed Assets / Revenues
401	16%	EXPEDITORS INTL WASH INC	0.1x
402	15%	MSCI INC	0.1x
403	15%	H&R BLOCK INC	0.1x
404	15%	NIELSEN HOLDINGS PLC	0.1x
405	15%	DISCOVER FINANCIAL SERVICES	0.1x
406	15%	VIACOM INC-CLASS B	0.1x
407	14%	KLA-TENCOR CORP	0.1x
408	14%	RED HAT INC	0.1x
409	14%	AUTODESK INC	0.1x
410	14%	UNITED RENTALS INC	0.1x
411	13%	FISERV INC	0.1x
412	13%	MONSTER BEVERAGE CORP	0.1x
413	13%	F5 NETWORKS INC	0.1x
414	13%	ARTHUR J GALLAGHER & CO	0.1x
415	13%	GARTNER INC	0.1x
416	12%	FIDELITY NATIONAL INFO SERV	0.1x
417	12%	MASTERCARD INC - A	0.1x
418	12%	TOTAL SYSTEM SERVICES INC	0.1x
419	12%	JEFFERIES FINANCIAL GROUP INC	0.1x
420	12%	RAYMOND JAMES FINANCIAL INC	0.1x
421	11%	TWENTY-FIRST CENTURY FOX - B	0.1x
422	11%	TWENTY-FIRST CENTURY FOX-A	0.1x
423	11%	SVB FINANCIAL GROUP	0.1x
424	11%	CISCO SYSTEMS INC	0.1x
425	11%	HARTFORD FINANCIAL SVCS GRP	0.1x
426	10%	AUTOMATIC DATA PROCESSING	0.1x
427	10%	BEST BUY CO INC	0.1x
428	10%	GENUINE PARTS CO	0.1x
429	10%	TAKE-TWO INTERACTIVE SOFTWARI	0.1x
430	9%	AON PLC	0.1x
431	9%	FLUOR CORP	0.1x
432	9%	CVS HEALTH CORP	0.1x
433	9%	ASSURANT INC	0.1x
434	9%	PRINCIPAL FINANCIAL GROUP	0.1x
435	8%	ANSYS INC	0.1x
436	8%	MARSH & MCLENNAN COS	0.1x
437	8%	HASBRO INC	0.0x
438	8%	AFFILIATED MANAGERS GROUP	0.0x
439	8%	BLACKROCK INC	0.0x
440	7%	BROADRIDGE FINANCIAL SOLUTIONS	0.0x

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Net Fixed Assets to Revenues
Last Twelve Months as of 12/31/17
For S&P 500 Constituents

Rank	Percentile	Company	2017 Net Fixed Assets / Revenues
441	7%	S&P GLOBAL INC	0.0x
442	7%	OMNICOM GROUP	0.0x
443	7%	IQVIA HOLDINGS INC	0.0x
444	7%	ARISTA NETWORKS INC	0.0x
445	6%	UNUM GROUP	0.0x
446	6%	CBRE GROUP INC - A	0.0x
447	6%	ACTIVISION BLIZZARD INC	0.0x
448	6%	PROGRESSIVE CORP	0.0x
449	5%	WESTERN UNION CO	0.0x
450	5%	HILTON WORLDWIDE HOLDINGS IN	0.0x
451	5%	BOOKING HOLDINGS INC	0.0x
452	5%	CIGNA CORP	0.0x
453	5%	HP INC	0.0x
454	4%	UNITEDHEALTH GROUP INC	0.0x
455	4%	CINCINNATI FINANCIAL CORP	0.0x
456	4%	ROPER TECHNOLOGIES INC	0.0x
457	4%	JACOBS ENGINEERING GROUP INC	0.0x
458	4%	ACCENTURE PLC-CL A	0.0x
459	3%	HUMANA INC	0.0x
460	3%	ALLSTATE CORP	0.0x
461	3%	ROBERT HALF INTL INC	0.0x
462	3%	NETFLIX INC	0.0x
463	3%	TORCHMARK CORP	0.0x
464	2%	DR HORTON INC	0.0x
465	2%	ANTHEM INC	0.0x
466	2%	CENTENE CORP	0.0x
467	2%	AFLAC INC	0.0x
468	1%	WELLCARE HEALTH PLANS INC	0.0x
469	1%	CARDINAL HEALTH INC	0.0x
470	1%	C.H. ROBINSON WORLDWIDE INC	0.0x
471	1%	MCKESSON CORP	0.0x
472	1%	AMERISOURCEBERGEN CORP	0.0x
473	0%	PULTEGROUP INC	0.0x
474	0%	AMERICAN INTERNATIONAL GROUP	0.0x
475	N/A	ADVANCE AUTO PARTS INC	N/A
476	N/A	ADVANCED MICRO DEVICES	N/A
477	N/A	AMERIPRISE FINANCIAL INC	N/A
478	N/A	AVERY DENNISON CORP	N/A
479	N/A	BRIGHTHOUSE FINANCIAL INC	N/A
480	N/A	CITIGROUP INC	N/A

Source: Bloomberg and CEI 2017 Form 10-K.

Net Fixed Assets to Revenues
Last Twelve Months as of 12/31/17
For S&P 500 Constituents

Rank	Percentile	Company	2017 Net Fixed Assets / Revenues
481	N/A	CHUBB LTD	N/A
482	N/A	CADENCE DESIGN SYS INC	N/A
483	N/A	CERNER CORP	N/A
484	N/A	EVERGY INC	N/A
485	N/A	GARMIN LTD	N/A
486	N/A	HANESBRANDS INC	N/A
487	N/A	HENRY SCHEIN INC	N/A
488	N/A	INTEL CORP	N/A
489	N/A	KELLOGG CO	N/A
490	N/A	KRAFT HEINZ CO/THE	N/A
491	N/A	LENNAR CORP-A	N/A
492	N/A	LINCOLN NATIONAL CORP	N/A
493	N/A	METLIFE INC	N/A
494	N/A	MCCORMICK & CO-NON VTG SHRS	N/A
495	N/A	MORGAN STANLEY	N/A
496	N/A	PEPSICO INC	N/A
497	N/A	PRUDENTIAL FINANCIAL INC	N/A
498	N/A	EVEREST RE GROUP LTD	N/A
499	N/A	SNAP-ON INC	N/A
500	N/A	STANLEY BLACK & DECKER INC	N/A
501	N/A	SYNCHRONY FINANCIAL	N/A
502	N/A	TRAVELERS COS INC/THE	N/A
503	N/A	TRACTOR SUPPLY COMPANY	N/A
504	N/A	TEXTRON INC	N/A
505	N/A	VF CORP	N/A

Average	**0.9x**
Median	**0.2x**
Consolidated Edison Co. of NY	**3.2x**

Source: Bloomberg and CEI 2017 Form 10-K.

Depreciation & Amortization to Capex
Last Twelve Months as of 12/31/17
For S&P 500 Constituents

Rank	Percentile	Company	2017 Depreciation/ Capex
1	100%	TORCHMARK CORP	2,417.6%
2	100%	ALLERGAN PLC	2,105.9%
3	99%	FIDELITY NATIONAL INFO SERV	959.3%
4	99%	DXC TECHNOLOGY CO	899.1%
5	99%	HOLOGIC INC	822.4%
6	99%	ACTIVISION BLIZZARD INC	773.5%
7	99%	XEROX CORP	763.8%
8	98%	HARTFORD FINANCIAL SVCS GRP	726.4%
9	98%	MYLAN NV	654.5%
10	98%	BROADCOM LTD	642.7%
11	98%	HILTON WORLDWIDE HOLDINGS IN	598.3%
12	97%	TOTAL SYSTEM SERVICES INC	579.5%
13	97%	ROPER TECHNOLOGIES INC	579.4%
14	97%	AFFILIATED MANAGERS GROUP	576.8%
15	97%	NIELSEN HOLDINGS PLC	537.8%
16	97%	CBOE GLOBAL MARKETS INC	512.5%
17	96%	PERRIGO CO PLC	502.0%
18	96%	AON PLC	486.9%
19	96%	SYMANTEC CORP	450.7%
20	96%	SBA COMMUNICATIONS CORP	437.4%
21	96%	THERMO FISHER SCIENTIFIC INC	400.2%
22	95%	WESTERN UNION CO	380.5%
23	95%	JACK HENRY & ASSOCIATES INC	378.7%
24	95%	FLEETCOR TECHNOLOGIES INC	368.7%
25	95%	NATIONAL OILWELL VARCO INC	363.5%
26	94%	MID-AMERICA APARTMENT COMM	363.5%
27	94%	KEYCORP	363.4%
28	94%	REGIONS FINANCIAL CORP	358.0%
29	94%	ANSYS INC	353.4%
30	94%	ABBOTT LABORATORIES	346.5%
31	93%	CINCINNATI FINANCIAL CORP	343.8%
32	93%	PFIZER INC	320.5%
33	93%	ANALOG DEVICES INC	313.5%
34	93%	ARTHUR J GALLAGHER & CO	298.6%
35	93%	MICROCHIP TECHNOLOGY INC	297.8%
36	92%	AMGEN INC	294.4%
37	92%	PERKINELMER INC	284.4%
38	92%	ABBVIE INC	283.7%
39	92%	CHURCH & DWIGHT CO INC	278.7%
40	91%	WILLIS TOWERS WATSON PLC	277.7%

Source: Bloomberg and CEI 2017 Form 10-K.

Depreciation & Amortization to Capex
Last Twelve Months as of 12/31/17
For S&P 500 Constituents

Rank	Percentile	Company	2017 Depreciation/ Capex
41	91%	IQVIA HOLDINGS INC	274.0%
42	91%	CARDINAL HEALTH INC	268.8%
43	91%	QORVO INC	264.7%
44	91%	BOSTON SCIENTIFIC CORP	264.6%
45	90%	CISCO SYSTEMS INC	262.8%
46	90%	PRINCIPAL FINANCIAL GROUP	261.1%
47	90%	PENTAIR PLC	258.0%
48	90%	E*TRADE FINANCIAL CORP	256.9%
49	90%	CME GROUP INC	254.6%
50	89%	GLOBAL PAYMENTS INC	248.0%
51	89%	MEDTRONIC PLC	247.6%
52	89%	TWITTER INC	246.3%
53	89%	WESTERN DIGITAL CORP	246.2%
54	88%	MERCK & CO. INC.	245.6%
55	88%	SHERWIN-WILLIAMS CO/THE	245.4%
56	88%	DISCOVERY COMMUNICATIONS-A	244.4%
57	88%	DISCOVERY COMMUNICATIONS-C	244.4%
58	88%	AMETEK INC	244.1%
59	87%	IHS MARKIT LTD	243.0%
60	87%	MSCI INC	241.1%
61	87%	TECHNIPFMC PLC	240.4%
62	87%	CAPITAL ONE FINANCIAL CORP	239.7%
63	87%	PEOPLE'S UNITED FINANCIAL	238.3%
64	86%	TAKE-TWO INTERACTIVE SOFTWARE INC	235.4%
65	86%	KEYSIGHT TECHNOLOGIES INC	234.8%
66	86%	MCKESSON CORP	234.8%
67	86%	C.H. ROBINSON WORLDWIDE INC	231.7%
68	85%	CBRE GROUP INC - A	228.1%
69	85%	ROLLINS INC	225.0%
70	85%	BECTON DICKINSON AND CO	221.0%
71	85%	ALLIANCE DATA SYSTEMS CORP	220.8%
72	85%	MAXIM INTEGRATED PRODUCTS INC	220.4%
73	84%	DENTSPLY SIRONA INC	219.3%
74	84%	GILEAD SCIENCES INC	218.0%
75	84%	GARTNER INC	216.8%
76	84%	ZIMMER BIOMET HOLDINGS INC	215.6%
77	84%	AUTODESK INC	213.8%
78	83%	AMERICAN TOWER CORP	213.5%
79	83%	HUNTINGTON BANCSHARES INC	212.9%
80	83%	SYNOPSYS INC	211.4%

Source: Bloomberg and CEI 2017 Form 10-K.

Depreciation & Amortization to Capex
Last Twelve Months as of 12/31/17
For S&P 500 Constituents

Rank	Percentile	Company	2017 Depreciation/ Capex
81	83%	CITRIX SYSTEMS INC	210.2%
82	82%	JACOBS ENGINEERING GROUP INC	209.3%
83	82%	INTUIT INC	204.0%
84	82%	MACY'S INC	203.5%
85	82%	DOVER CORP	200.4%
86	82%	DANAHER CORP	199.9%
87	81%	QUALCOMM INC	199.1%
88	81%	XILINX INC	193.8%
89	81%	CITIZENS FINANCIAL GROUP	192.5%
90	81%	FLOWSERVE CORP	192.3%
91	81%	RESMED INC	191.7%
92	80%	HARRIS CORP	190.4%
93	80%	DISH NETWORK CORP-A	189.3%
94	80%	PARKER HANNIFIN CORP	188.2%
95	80%	CF INDUSTRIES HOLDINGS INC	186.7%
96	79%	ASSURANT INC	186.3%
97	79%	H&R BLOCK INC	185.9%
98	79%	AUTOMATIC DATA PROCESSING	183.2%
99	79%	RALPH LAUREN CORP	182.7%
100	79%	SCHLUMBERGER LTD	182.1%
101	78%	BROADRIDGE FINANCIAL SOLUTIONS INC	181.7%
102	78%	OMNICOM GROUP	180.8%
103	78%	DISCOVER FINANCIAL SERVICES	180.3%
104	78%	M & T BANK CORP	178.5%
105	78%	SUNTRUST BANKS INC	177.3%
106	77%	TRANSDIGM GROUP INC	177.0%
107	77%	EATON CORP PLC	175.8%
108	77%	COMERICA INC	175.4%
109	77%	MOODY'S CORP	174.7%
110	76%	TRIPADVISOR INC	173.4%
111	76%	CAPRI HOLDINGS	173.3%
112	76%	JOHNSON & JOHNSON	172.1%
113	76%	LABORATORY CRP OF AMER HLDGS	170.4%
114	76%	MACERICH CO/THE	168.8%
115	75%	CELGENE CORP	168.8%
116	75%	FLIR SYSTEMS INC	168.6%
117	75%	ROYAL CARIBBEAN CRUISES LTD	168.6%
118	75%	BAKER HUGHES A GE CO	165.9%
119	75%	COTY INC-CL A	165.1%
120	74%	SEAGATE TECHNOLOGY	163.4%

Source: Bloomberg and CEI 2017 Form 10-K.

Depreciation & Amortization to Capex
Last Twelve Months as of 12/31/17
For S&P 500 Constituents

Rank	Percentile	Company	2017 Depreciation/ Capex
121	74%	NUCOR CORP	162.1%
122	74%	ALLSTATE CORP	161.5%
123	74%	ROBERT HALF INTL INC	160.7%
124	73%	ORACLE CORP	160.4%
125	73%	INGERSOLL-RAND PLC	159.6%
126	73%	MARSH & MCLENNAN COS	159.3%
127	73%	PULTEGROUP INC	159.1%
128	73%	IRON MOUNTAIN INC	156.6%
129	72%	NEWELL BRANDS INC	156.5%
130	72%	COGNIZANT TECH SOLUTIONS-A	156.0%
131	72%	ILLINOIS TOOL WORKS	155.6%
132	72%	BLACKROCK INC	154.8%
133	72%	VARIAN MEDICAL SYSTEMS INC	152.4%
134	71%	NEKTAR THERAPEUTICS	152.3%
135	71%	PROGRESSIVE CORP	151.6%
136	71%	AMERISOURCEBERGEN CORP	151.6%
137	71%	MOTOROLA SOLUTIONS INC	151.1%
138	70%	FISERV INC	150.9%
139	70%	HOLLYFRONTIER COPR	150.6%
140	70%	INTERCONTINENTAL EXCHANGE IN	149.9%
141	70%	ACCENTURE PLC-CL A	149.7%
142	70%	JUNIPER NETWORKS INC	149.2%
143	69%	CONOCOPHILLIPS	149.1%
144	69%	HESS CORP	148.8%
145	69%	HARLEY-DAVIDSON INC	147.9%
146	69%	FIFTH THIRD BANCORP	147.6%
147	69%	FRANKLIN RESOURCES INC	147.5%
148	68%	KOHLS CORP	147.5%
149	68%	S&P GLOBAL INC	146.3%
150	68%	MASTERCARD INC - A	145.7%
151	68%	ELI LILLY & CO	145.6%
152	67%	GENERAL MOTORS CO	145.0%
153	67%	AMERIPRISE FINANCIAL INC	144.4%
154	67%	CHEVRON CORP	144.4%
155	67%	NEWMONT MINING CORP	144.2%
156	67%	VALERO ENERGY CORP	144.0%
157	66%	COOPER COS INC/THE	142.1%
158	66%	SALESFORCE.COM INC	140.9%
159	66%	INTL BUSINESS MACHINES CORP	140.6%
160	66%	ALEXION PHARMACEUTICALS INC	139.0%

Source: Bloomberg and CEI 2017 Form 10-K.

Depreciation & Amortization to Capex
Last Twelve Months as of 12/31/17
For S&P 500 Constituents

Rank	Percentile	Company	2017 Depreciation/ Capex
161	66%	XYLEM INC	137.6%
162	65%	LOWE'S COS INC	137.1%
163	65%	NETAPP INC	136.6%
164	65%	SIMON PROPERTY GROUP INC	136.2%
165	65%	ALLEGION PLC	135.7%
166	64%	MOLSON COORS BREWING CO -B	135.6%
167	64%	ARISTA NETWORKS INC	135.1%
168	64%	EQUIFAX INC	133.3%
169	64%	FMC CORP	131.9%
170	64%	ROCKWELL AUTOMATION INC	131.2%
171	63%	BALL CORP	131.1%
172	63%	NASDAQ INC	130.6%
173	63%	TEXAS INSTRUMENTS INC	130.1%
174	63%	ADOBE SYSTEMS INC	130.0%
175	63%	NEWS CORP - CLASS B	129.7%
176	62%	NEWS CORP - CLASS A	129.7%
177	62%	WALGREENS BOOTS ALLIANCE INC	129.5%
178	62%	VERISK ANALYTICS INC	129.4%
179	62%	CVS HEALTH CORP	129.2%
180	61%	EXXON MOBIL CORP	129.2%
181	61%	LKQ CORP	128.5%
182	61%	JM SMUCKER CO/THE	128.3%
183	61%	FORTIVE CORP	127.9%
184	61%	PPG INDUSTRIES INC	127.8%
185	60%	HASBRO INC	127.4%
186	60%	ELECTRONIC ARTS INC	127.1%
187	60%	CENTURYLINK INC	126.7%
188	60%	BOOKING HOLDINGS INC	126.0%
189	60%	WESTROCK CO	125.2%
190	59%	EXPEDIA INC	125.2%
191	59%	HELMERICH & PAYNE	125.1%
192	59%	BIOGEN INC	124.6%
193	59%	AMERICAN EXPRESS CO	124.4%
194	58%	WEYERHAEUSER CO	124.3%
195	58%	WATERS CORP	124.0%
196	58%	CATERPILLAR INC	123.2%
197	58%	BANK OF NEW YORK MELLON CORP	123.1%
198	58%	EMERSON ELECTRIC CO	122.9%
199	57%	CHARTER COMMUNICATIONS INC-A	122.0%
200	57%	FREEPORT-MCMORAN INC	121.6% a

Source: Bloomberg and CEI 2017 Form 10-K.

Depreciation & Amortization to Capex
Last Twelve Months as of 12/31/17
For S&P 500 Constituents

Rank	Percentile	Company	2017 Depreciation/ Capex
201	57%	MARRIOTT INTERNATIONAL -CL A	120.8%
202	57%	PAYPAL HOLDINGS INC	120.7%
203	57%	CBS CORP-CLASS B NON VOTING	120.5%
204	56%	SL GREEN REALTY CORP	120.3%
205	56%	CIGNA CORP	120.2%
206	56%	MARATHON OIL CORP	120.2%
207	56%	BAXTER INTERNATIONAL INC	120.0%
208	55%	FORD MOTOR CO	119.9%
209	55%	VIACOM INC-CLASS B	119.7%
210	55%	LAM RESEARCH CORP	119.4%
211	55%	BOEING CO/THE	119.0%
212	55%	AGILENT TECHNOLOGIES INC	118.6%
213	54%	TWENTY-FIRST CENTURY FOX - B	118.5%
214	54%	TWENTY-FIRST CENTURY FOX-A	118.5%
215	54%	CELANESE CORP	116.1%
216	54%	CUMMINS INC	115.2%
217	54%	RED HAT INC	114.3%
218	53%	HALLIBURTON CO	113.3%
219	53%	AT&T INC	113.2%
220	53%	ECOLAB INC	113.1%
221	53%	REPUBLIC SERVICES INC	112.8%
222	52%	3M CO	112.5%
223	52%	IDEXX LABORATORIES INC	111.8%
224	52%	HOST HOTELS & RESORTS INC	111.6%
225	52%	PACKAGING CORP OF AMERICA	111.6%
226	52%	ANTHEM INC	111.4%
227	51%	SYSCO CORP	111.3%
228	51%	WW GRAINGER INC	111.3%
229	51%	F5 NETWORKS INC	111.3%
230	51%	UNITEDHEALTH GROUP INC	111.0%
231	51%	SVB FINANCIAL GROUP	110.3%
232	50%	VENTAS INC	109.4%
233	50%	NRG ENERGY INC	109.4%
234	50%	CITIGROUP INC	108.9%
235	50%	HOME DEPOT INC	108.7%
236	49%	HONEYWELL INTERNATIONAL INC	108.1%
237	49%	ZOETIS INC	108.0%
238	49%	MORGAN STANLEY	107.6%
239	49%	COMCAST CORP-CLASS A	107.5%
240	49%	STRYKER CORP	107.4%

Source: Bloomberg and CEI 2017 Form 10-K.

Depreciation & Amortization to Capex
Last Twelve Months as of 12/31/17
For S&P 500 Constituents

Rank	Percentile	Company	2017 Depreciation/ Capex
241	48%	QUEST DIAGNOSTICS INC	107.1%
242	48%	CAMPBELL SOUP CO	107.1%
243	48%	GENUINE PARTS CO	107.0%
244	48%	UNITED TECHNOLOGIES CORP	106.3%
245	48%	FASTENAL CO	106.3%
246	47%	ZIONS BANCORPORATION	105.9%
247	47%	JOHNSON CONTROLS INTERNATION	105.3%
248	47%	ALTRIA GROUP INC	105.0%
249	47%	WAL-MART STORES INC	104.8%
250	46%	INVESCO LTD	104.6%
251	46%	GENERAL DYNAMICS CORP	103.0%
252	46%	CINTAS CORP	102.8%
253	46%	INTERNATIONAL PAPER CO	102.3%
254	46%	CONAGRA BRANDS INC	102.1%
255	45%	HERSHEY CO/THE	101.6%
256	45%	LOCKHEED MARTIN CORP	101.5%
257	45%	EBAY INC	101.5%
258	45%	RAYTHEON COMPANY	101.3%
259	45%	CROWN CASTLE INTL CORP	101.2%
260	44%	INTERPUBLIC GROUP OF COS INC	100.8%
261	44%	VERISIGN INC	100.8%
262	44%	L3 TECHNOLOGIES INC	100.4%
263	44%	AMPHENOL CORP-CL A	100.1%
264	43%	GENERAL MILLS INC	99.4%
265	43%	BEST BUY CO INC	99.3%
266	43%	VERIZON COMMUNICATIONS INC	98.3%
267	43%	TAPESTRY INC	97.3%
268	43%	APARTMENT INVT & MGMT CO -A	96.8%
269	42%	ESSEX PROPERTY TRUST INC	96.7%
270	42%	HP INC	96.7%
271	42%	DOLLAR TREE INC	96.7%
272	42%	TARGET CORP	96.5%
273	42%	AMAZON.COM INC	96.0%
274	41%	WHIRLPOOL CORP	95.6%
275	41%	WELLCARE HEALTH PLANS INC	93.8%
276	41%	KLA-TENCOR CORP	93.6%
277	41%	UDR INC	92.6%
278	40%	MATTEL INC	92.5%
279	40%	ARCONIC INC	92.4%
280	40%	KIMBERLY-CLARK CORP	92.2%

Source: Bloomberg and CEI 2017 Form 10-K.

Depreciation & Amortization to Capex
Last Twelve Months as of 12/31/17
For S&P 500 Constituents

Rank	Percentile	Company	2017 Depreciation/ Capex
281	40%	HUMANA INC	92.2%
282	40%	DR HORTON INC	91.6%
283	39%	INTL FLAVORS & FRAGRANCES	91.5%
284	39%	WASTE MANAGEMENT INC	91.2%
285	39%	NORDSTROM INC	91.1%
286	39%	PVH CORP	90.7%
287	39%	EASTMAN CHEMICAL CO	90.4%
288	38%	AKAMAI TECHNOLOGIES INC	89.8%
289	38%	NORTHERN TRUST CORP	89.2%
290	38%	GOODYEAR TIRE & RUBBER CO	88.6%
291	38%	QUANTA SERVICES INC	88.3%
292	37%	MICROSOFT CORP	88.2%
293	37%	ARCHER-DANIELS-MIDLAND CO	88.1%
294	37%	HEWLETT PACKARD ENTERPRISE	87.1%
295	37%	KROGER CO	86.7%
296	37%	TIFFANY & CO	86.5%
297	36%	COLGATE-PALMOLIVE CO	85.9%
298	36%	DAVITA INC	85.9%
299	36%	OCCIDENTAL PETROLEUM CORP	85.8%
300	36%	CLOROX COMPANY	85.6%
301	36%	CENTENE CORP	85.5%
302	35%	VISA INC-CLASS A SHARES	85.4%
303	35%	ANADARKO PETROLEUM CORP	85.1%
304	35%	JEFFERIES FINANCIAL GROUP INC	84.8%
305	35%	LOEWS CORP	84.8%
306	34%	ESTEE LAUDER COMPANIES-CL A	84.4%
307	34%	ROSS STORES INC	84.3%
308	34%	EOG RESOURCES INC	82.7%
309	34%	BRISTOL-MYERS SQUIBB CO	82.7%
310	34%	APACHE CORP	82.6%
311	33%	APPLE INC	81.9%
312	33%	SEALED AIR CORP	81.2%
313	33%	MOSAIC CO/THE	81.1%
314	33%	L BRANDS INC	80.8%
315	33%	MONDELEZ INTERNATIONAL INC-A	80.5%
316	32%	UNIVERSAL HEALTH SERVICES-B	80.3%
317	32%	FLUOR CORP	79.6%
318	32%	YUM! BRANDS INC	79.6%
319	32%	ONEOK INC	79.3%
320	31%	DARDEN RESTAURANTS INC	79.1%

Source: Bloomberg and CEI 2017 Form 10-K.

Depreciation & Amortization to Capex
Last Twelve Months as of 12/31/17
For S&P 500 Constituents

Rank	Percentile	Company	2017 Depreciation/ Capex
321	31%	LEGGETT & PLATT INC	79.0%
322	31%	FORTUNE BRANDS HOME & SECURI	79.0%
323	31%	EQUITY RESIDENTIAL	79.0%
324	31%	TYSON FOODS INC-CL A	78.6%
325	30%	BERKSHIRE HATHAWAY INC-CL B	78.5%
326	30%	APTIV PLC	78.2%
327	30%	NOBLE ENERGY INC	77.5%
328	30%	MARATHON PETROLEUM CORP	77.4%
329	30%	T ROWE PRICE GROUP INC	77.2%
330	29%	GAP INC/THE	76.5%
331	29%	PROCTER & GAMBLE CO/THE	76.2%
332	29%	LYONDELLBASELL INDU-CL A	75.9%
333	29%	CHIPOTLE MEXICAN GRILL INC	75.4%
334	28%	COCA-COLA CO/THE	75.2%
335	28%	SMITH (A.O.) CORP	74.4%
336	28%	CABOT OIL & GAS CORP	74.4%
337	28%	DEVON ENERGY CORP	73.9%
338	28%	RAYMOND JAMES FINANCIAL INC	73.9%
339	27%	MCDONALD'S CORP	73.6%
340	27%	APPLIED MATERIALS INC	73.5%
341	27%	VORNADO REALTY TRUST	73.4%
342	27%	MASCO CORP	73.4%
343	27%	UNITED RENTALS INC	73.2%
344	26%	BORGWARNER INC	72.8%
345	26%	HUNT (JB) TRANSPRT SVCS INC	72.8%
346	26%	NIKE INC -CL B	72.7%
347	26%	CENTERPOINT ENERGY INC	72.7%
348	25%	MARTIN MARIETTA MATERIALS	72.4%
349	25%	PHILLIPS 66	71.9%
350	25%	WELLTOWER INC	71.6%
351	25%	TE CONNECTIVITY LTD	71.3%
352	25%	PAYCHEX INC	71.2%
353	24%	WILLIAMS COS INC	71.1%
354	24%	SKYWORKS SOLUTIONS INC	70.9%
355	24%	KINDER MORGAN INC	70.8%
356	24%	EQUINIX INC	70.7%
357	24%	HCA HEALTHCARE INC	70.7%
358	23%	REGENCY CENTERS CORP	70.0%
359	23%	GENERAL ELECTRIC CO	69.7%
360	23%	KIMCO REALTY CORP	69.2%

Source: Bloomberg and CEI 2017 Form 10-K.

Depreciation & Amortization to Capex
Last Twelve Months as of 12/31/17
For S&P 500 Constituents

Rank	Percentile	Company	2017 Depreciation/ Capex
361	23%	EXELON CORP	69.1%
362	22%	TJX COMPANIES INC	68.6%
363	22%	WALT DISNEY CO/THE	67.4%
364	22%	SCHWAB (CHARLES) CORP	67.3%
365	22%	VULCAN MATERIALS CO	66.6%
366	22%	AUTOZONE INC	66.1%
367	21%	STARBUCKS CORP	66.1%
368	21%	DEERE & CO	65.3%
369	21%	UNION PACIFIC CORP	65.0%
370	21%	CSX CORP	64.5%
371	21%	CORNING INC	64.2%
372	20%	FOOT LOCKER INC	63.1%
373	20%	DOLLAR GENERAL CORP	62.5%
374	20%	ALBEMARLE CORP	62.0%
375	20%	AIR PRODUCTS & CHEMICALS INC	61.9%
376	19%	VERTEX PHARMACEUTICALS INC	61.8%
377	19%	NORFOLK SOUTHERN CORP	61.5%
378	19%	UNDER ARMOUR INC-CLASS C	61.4%
379	19%	UNDER ARMOUR INC-CLASS A	61.4%
380	19%	PUBLIC STORAGE	60.9%
381	18%	CARMAX INC	60.6%
382	18%	PACCAR INC	60.0%
383	18%	FIRSTENERGY CORP	59.8%
384	18%	METTLER-TOLEDO INTERNATIONAL	59.7%
385	18%	WYNN RESORTS LTD	59.0%
386	17%	BOSTON PROPERTIES INC	58.7%
387	17%	MONSTER BEVERAGE CORP	58.6%
388	17%	EDISON INTERNATIONAL	58.2%
389	17%	DELTA AIR LINES INC	57.4%
390	16%	SOUTHWEST AIRLINES CO	57.4%
391	16%	ULTA BEAUTY INC	57.3%
392	16%	PHILIP MORRIS INTERNATIONAL	56.5%
393	16%	FIRST REPUBLIC BANK	55.2%
394	16%	FEDEX CORP	54.7%
395	15%	CARNIVAL CORP	53.8%
396	15%	UNITED CONTINENTAL HOLDINGS	53.8%
397	15%	AES CORP	53.7%
398	15%	HUNTINGTON INGALLS INDUSTRIE	53.7%
399	15%	MICRON TECHNOLOGY INC	53.6%
400	14%	REGENERON PHARMACEUTICALS	53.4%

Source: Bloomberg and CEI 2017 Form 10-K.

Depreciation & Amortization to Capex
Last Twelve Months as of 12/31/17
For S&P 500 Constituents

Rank	Percentile	Company	2017 Depreciation/ Capex
401	14%	MGM RESORTS INTERNATIONAL	53.3%
402	14%	ALPHABET INC-CL C	52.4%
403	14%	ALPHABET INC-CL A	52.4%
404	13%	HCP INC	52.3%
405	13%	PUBLIC SERVICE ENTERPRISE GP	52.1%
406	13%	INTUITIVE SURGICAL INC	52.0%
407	13%	EXPEDITORS INTL WASH INC	51.9%
408	13%	PIONEER NATURAL RESOURCES CO	51.8%
409	12%	NORTHROP GRUMMAN CORP	51.2%
410	12%	KANSAS CITY SOUTHERN	51.1%
411	12%	IPG PHOTONICS CORP	51.0%
412	12%	ENTERGY CORP	50.7%
413	12%	ILLUMINA INC	50.3%
414	11%	P G & E CORP	50.3%
415	11%	DUKE ENERGY CORP	50.2%
416	11%	O'REILLY AUTOMOTIVE INC	50.2%
417	11%	BROWN-FORMAN CORP-CLASS B	50.0%
418	10%	CMS ENERGY CORP	49.5%
419	10%	MOHAWK INDUSTRIES INC	49.3%
420	10%	EDWARDS LIFESCIENCES CORP	48.7%
421	10%	DTE ENERGY COMPANY	48.4%
422	10%	COSTCO WHOLESALE CORP	48.4%
423	9%	XCEL ENERGY INC	48.1%
424	9%	PROLOGIS INC	47.1%
425	9%	INCYTE CORP	47.0%
426	9%	LAMB WESTON HOLDINGS INC	46.7%
427	9%	CONCHO RESOURCES INC	45.2%
428	8%	FACEBOOK INC-A	44.9%
429	8%	SOUTHERN CO/THE	44.7%
430	8%	UNITED PARCEL SERVICE-CL B	43.7%
431	8%	PINNACLE WEST CAPITAL	43.3%
432	7%	AMEREN CORPORATION	43.0%
433	7%	HORMEL FOODS CORP	41.5%
434	7%	FORTINET INC	41.0%
435	7%	WEC ENERGY GROUP INC	40.8%
436	7%	AVALONBAY COMMUNITIES INC	39.7%
437	6%	NORWEGIAN CRUISE LINE HOLDIN	38.0%
438	6%	SEMPRA ENERGY	37.7%
439	6%	DOMINION ENERGY INC	37.3%
440	6%	DIGITAL REALTY TRUST INC	36.8%

Source: Bloomberg and CEI 2017 Form 10-K.

Depreciation & Amortization to Capex
Last Twelve Months as of 12/31/17
For S&P 500 Constituents

Rank	Percentile	Company	2017 Depreciation/ Capex
441	6%	EVERSOURCE ENERGY	36.8%
442	5%	AMERICAN ELECTRIC POWER	36.7%
443	5%	CONSTELLATION BRANDS INC-A	36.5%
444	5%	ALASKA AIR GROUP INC	36.3%
445	5%	NEWFIELD EXPLORATION CO	36.2%
446	4%	GOLDMAN SACHS GROUP INC	36.2%
447	**4%**	**CONSOLIDATED EDISON INC**	**35.9%**
448	4%	REALTY INCOME CORP	34.9%
449	4%	CIMAREX ENERGY CO	34.9%
450	4%	PPL CORP	34.8%
451	3%	AMERICAN AIRLINES GROUP INC	33.8%
452	3%	NISOURCE INC	33.6%
453	3%	STATE STREET CORP	33.6%
454	3%	NVIDIA CORP	33.6%
455	3%	AMERICAN WATER WORKS CO INC	32.6%
456	2%	NETFLIX INC	31.7%
457	2%	ALLIANT ENERGY CORP	31.5%
458	2%	EXTRA SPACE STORAGE INC	27.9%
459	2%	COPART INC	27.5%
460	1%	ALEXANDRIA REAL ESTATE EQUIT	26.6%
461	1%	NEXTERA ENERGY INC	24.4%
462	1%	FEDERAL REALTY INVS TRUST	22.6%
463	1%	ABIOMED INC	19.7%
464	1%	ALIGN TECHNOLOGY INC	19.3%
465	0%	DUKE REALTY CORP	13.3%
466	0%	DIAMONDBACK ENERGY INC	10.1%
467	N/A	ADVANCE AUTO PARTS INC	N/A
468	N/A	AFLAC INC	N/A
469	N/A	AMERICAN INTERNATIONAL GROUP	N/A
470	N/A	ADVANCED MICRO DEVICES	N/A
471	N/A	AVERY DENNISON CORP	N/A
472	N/A	BANK OF AMERICA CORP	N/A
473	N/A	BB&T CORP	N/A
474	N/A	BRIGHTHOUSE FINANCIAL INC	N/A
475	N/A	CHUBB LTD	N/A
476	N/A	CADENCE DESIGN SYS INC	N/A
477	N/A	CERNER CORP	N/A
478	N/A	DOWDUPONT INC	N/A
479	N/A	EVERGY INC	N/A
480	N/A	GARMIN LTD	N/A

Source: Bloomberg and CEI 2017 Form 10-K.

Depreciation & Amortization to Capex
Last Twelve Months as of 12/31/17
For S&P 500 Constituents

Rank	Percentile	Company	2017 Depreciation/ Capex
481	N/A	HANESBRANDS INC	N/A
482	N/A	HENRY SCHEIN INC	N/A
483	N/A	INTEL CORP	N/A
484	N/A	JPMORGAN CHASE & CO	N/A
485	N/A	KELLOGG CO	N/A
486	N/A	KRAFT HEINZ CO/THE	N/A
487	N/A	LENNAR CORP-A	N/A
488	N/A	LINDE PLC	N/A
489	N/A	LINCOLN NATIONAL CORP	N/A
490	N/A	METLIFE INC	N/A
491	N/A	MCCORMICK & CO-NON VTG SHRS	N/A
492	N/A	PEPSICO INC	N/A
493	N/A	PNC FINANCIAL SERVICES GROUP	N/A
494	N/A	PRUDENTIAL FINANCIAL INC	N/A
495	N/A	EVEREST RE GROUP LTD	N/A
496	N/A	SNAP-ON INC	N/A
497	N/A	STANLEY BLACK & DECKER INC	N/A
498	N/A	SYNCHRONY FINANCIAL	N/A
499	N/A	TRAVELERS COS INC/THE	N/A
500	N/A	TRACTOR SUPPLY COMPANY	N/A
501	N/A	TEXTRON INC	N/A
502	N/A	UNUM GROUP	N/A
503	N/A	US BANCORP	N/A
504	N/A	VF CORP	N/A
505	N/A	WELLS FARGO & CO	N/A

Average	**152%**
Median	**109%**
Consolidated Edison Co. of NY	**42%**

Source: Bloomberg and CEI 2017 Form 10-K.

Depreciation & Amortization to Capex
Last Twelve Months as of 12/31/17
For S&P 500 Utilities

Rank	Percentile	Company	2017 Depreciation/ Capex
1	100%	NRG ENERGY INC	109.4%
2	96%	CENTERPOINT ENERGY INC	72.7%
3	92%	EXELON CORP	69.1%
4	88%	FIRSTENERGY CORP	59.8%
5	85%	EDISON INTERNATIONAL	58.2%
6	81%	AES CORP	53.7%
7	77%	PUBLIC SERVICE ENTERPRISE GP	52.1%
8	73%	ENTERGY CORP	50.7%
9	69%	P G & E CORP	50.3%
10	65%	DUKE ENERGY CORP	50.2%
11	62%	CMS ENERGY CORP	49.5%
12	58%	DTE ENERGY COMPANY	48.4%
13	54%	XCEL ENERGY INC	48.1%
14	50%	SOUTHERN CO/THE	44.7%
15	46%	PINNACLE WEST CAPITAL	43.3%
16	42%	AMEREN CORPORATION	43.0%
17	38%	WEC ENERGY GROUP INC	40.8%
18	35%	SEMPRA ENERGY	37.7%
19	31%	DOMINION ENERGY INC	37.3%
20	27%	EVERSOURCE ENERGY	36.8%
21	23%	AMERICAN ELECTRIC POWER	36.7%
22	**19%**	**CONSOLIDATED EDISON INC**	**35.9%**
23	15%	PPL CORP	34.8%
24	12%	NISOURCE INC	33.6%
25	8%	AMERICAN WATER WORKS CO INC	32.6%
26	4%	ALLIANT ENERGY CORP	31.5%
27	0%	NEXTERA ENERGY INC	24.4%

Average	**47.6%**
Consolidated Edison Co. of New York	**42.1%**

Source: Bloomberg. CEI 2017 Form 10-K.

Company Name	Adjusted Cash Flows to Total Debt 2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
AEP Texas Inc	18.4%	18.1%	13.1%	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Alabama Power Co.	28.1%	26.1%	29.1%	26.7%	28.0%	26.5%	31.2%	29.3%	21.4%	23.6%
ALLETE Inc.	27.4%	21.8%	23.5%	20.8%	21.7%	23.7%	26.3%	26.9%	25.4%	25.1%
Ameren Illinois	27.2%	32.1%	27.8%	20.5%	29.0%	28.6%	26.4%	38.8%	32.0%	N/A
Appalachian Power Co.	20.9%	21.4%	20.2%	16.8%	17.4%	17.5%	11.3%	14.9%	11.7%	5.1%
Arizona Public Service Co.	27.4%	28.4%	32.4%	30.1%	41.2%	39.3%	31.7%	22.2%	31.1%	23.0%
Black Hills Power Inc.	24.5%	26.1%	22.4%	19.5%	26.3%	26.3%	18.9%	26.6%	17.1%	26.9%
Cleveland Elec Illuminating Co	15.9%	11.6%	10.7%	9.6%	8.8%	12.5%	10.3%	15.7%	6.5%	21.0%
Connecticut Light & Power Co.	25.6%	24.5%	11.5%	24.6%	21.2%	14.4%	18.0%	29.7%	24.4%	17.5%
Consumers Energy Co.	27.8%	24.2%	29.2%	24.6%	23.0%	27.6%	27.2%	18.6%	20.0%	24.1%
Duke Energy Carolinas LLC	26.3%	28.4%	31.0%	32.8%	30.1%	26.0%	22.0%	25.9%	22.7%	26.7%
Duke Energy Florida LLC	18.2%	17.5%	24.0%	28.6%	22.9%	14.8%	19.8%	26.3%	25.3%	12.5%
Duke Energy Indiana, LLC	22.7%	26.9%	25.5%	28.5%	24.6%	22.0%	18.1%	22.7%	19.4%	22.6%
Duke Energy Kentucky Inc.	21.8%	24.4%	26.8%	22.2%	25.6%	24.8%	28.7%	29.8%	26.2%	26.4%
Duke Energy Ohio Inc.	24.1%	23.5%	34.0%	21.4%	22.9%	20.9%	29.5%	30.8%	27.2%	33.8%
Duke Energy Progress LLC	23.2%	21.0%	21.1%	27.5%	25.3%	21.3%	27.4%	38.7%	35.2%	36.3%
El Paso Electric Co.	20.2%	19.8%	19.7%	22.5%	26.7%	25.8%	32.0%	28.1%	23.9%	23.7%
Entergy Arkansas LLC	16.7%	19.6%	21.5%	15.7%	20.6%	17.3%	23.6%	25.2%	21.7%	29.4%
Entergy Louisiana LLC	19.4%	24.5%	21.9%	28.1%	27.5%	20.0%	18.7%	47.8%	9.6%	68.3%
Entergy Mississippi LLC	19.5%	27.2%	25.3%	26.6%	22.1%	18.3%	14.1%	24.2%	15.0%	21.7%
Entergy Texas Inc.	17.3%	19.6%	16.1%	17.4%	21.9%	21.3%	14.8%	14.9%	2.3%	-10.7%
Georgia Power Co.	22.5%	20.4%	24.4%	25.0%	27.0%	26.8%	27.6%	19.8%	21.1%	25.5%
Gulf Power Co.	29.3%	24.2%	28.8%	23.4%	28.1%	32.9%	22.4%	23.7%	16.4%	21.5%
Hawaiian Electric Co.	23.7%	28.8%	27.9%	26.7%	21.4%	20.8%	22.4%	32.1%	21.7%	25.5%
Idaho Power Co.	23.2%	19.7%	20.9%	23.1%	21.1%	18.4%	21.1%	20.0%	21.7%	12.5%
Indiana Michigan Power Co.	22.4%	18.3%	26.7%	26.6%	26.7%	24.9%	26.1%	19.7%	35.3%	21.9%
Interstate Power & Light Co.	18.9%	20.1%	23.8%	20.9%	25.9%	22.1%	20.7%	29.3%	33.1%	29.9%
Jersey Cntrl Power & Light Co.	26.3%	19.4%	13.8%	13.6%	14.6%	17.2%	15.7%	29.3%	22.6%	28.0%
Kentucky Power Co.	17.0%	12.5%	14.3%	20.2%	19.4%	17.2%	18.6%	16.3%	20.0%	10.4%
Kentucky Utilities Co.	27.3%	25.9%	23.5%	28.9%	22.4%	25.7%	24.2%	19.4%	16.6%	N/A
Louisville Gas & Electric Co.	28.0%	26.4%	24.8%	28.0%	27.7%	28.4%	25.7%	21.6%	17.6%	N/A
Madison Gas and Electric Co.	32.6%	34.0%	33.4%	41.4%	34.6%	41.1%	34.1%	37.2%	34.0%	33.7%
Metropolitan Edison Co.	30.5%	26.6%	21.2%	18.4%	21.4%	21.1%	12.3%	28.1%	24.3%	21.2%
Mississippi Power Co.	1.5%	12.7%	14.6%	27.9%	25.4%	17.0%	18.5%	19.0%	20.2%	34.4%
Monongahela Power Co.	23.3%	19.1%	17.3%	14.6%	14.1%	19.6%	16.2%	25.9%	9.1%	6.9%
North Shore Gas Co.	20.3%	30.2%	23.7%	5.1%	23.1%	24.2%	32.0%	34.4%	19.9%	27.5%
Northern States Power Co - WI	25.2%	25.7%	28.7%	25.3%	29.2%	28.0%	36.8%	32.2%	38.7%	27.2%
Northern States Power Co. - MN	27.7%	28.3%	26.4%	28.2%	25.3%	25.6%	30.4%	30.3%	28.6%	28.5%
NorthWestern Corp.	16.1%	15.0%	16.7%	12.5%	17.3%	17.3%	21.1%	20.6%	15.5%	23.0%
NSTAR Electric Co.	21.0%	28.6%	25.7%	25.9%	32.0%	31.6%	36.4%	32.5%	25.4%	21.4%
Ohio Edison Co.	39.6%	27.7%	34.7%	34.1%	22.5%	28.1%	25.1%	23.9%	20.0%	32.1%
Ohio Power Co.	38.8%	39.8%	31.1%	26.5%	31.6%	25.5%	25.3%	26.4%	23.4%	14.2%
Oklahoma Gas and Electric Co.	21.7%	26.3%	26.3%	27.9%	27.5%	29.6%	25.9%	28.1%	35.1%	23.4%
Pennsylvania Electric Co.	21.2%	23.4%	17.0%	15.9%	15.4%	11.6%	17.5%	11.5%	7.8%	25.0%
Pennsylvania Power Co.	39.3%	37.5%	36.0%	27.8%	28.2%	28.4%	32.3%	42.4%	N/A	N/A
Peoples Gas Light & Coke Co.	10.9%	23.2%	23.7%	16.8%	19.7%	24.2%	N/A	N/A	N/A	N/A
Piedmont Natural Gas Co.	19.7%	6.1%	17.9%	22.2%	20.3%	20.6%	30.3%	24.1%	24.4%	20.8%
Portland General Electric Co.	25.1%	23.3%	26.0%	23.0%	25.5%	27.8%	26.2%	21.2%	18.8%	24.4%
Potomac Edison Co.	24.9%	28.8%	17.9%	19.3%	28.8%	19.0%	24.5%	9.4%	N/A	N/A
PPL Electric Utilities Corp.	28.9%	27.5%	24.4%	21.4%	20.1%	17.7%	17.5%	28.7%	38.7%	34.1%
Public Service Co. of CO	24.9%	25.6%	29.2%	27.3%	31.8%	19.3%	27.1%	23.7%	19.3%	29.8%
Public Service Co. of NH	21.4%	27.3%	25.7%	25.4%	17.6%	20.0%	20.7%	20.7%	19.8%	16.4%
Public Service Co. of NM	21.3%	18.2%	17.6%	22.8%	15.9%	18.2%	21.2%	17.4%	9.0%	11.1%
Public Service Co. of OK	16.9%	15.3%	26.0%	18.1%	18.7%	28.3%	33.9%	15.1%	19.1%	27.7%
Southern California Edison Co.	32.3%	30.3%	44.3%	33.8%	31.7%	41.6%	38.9%	46.7%	57.0%	16.1%
Southern Company Gas	11.9%	10.2%	23.1%	20.3%	16.6%	18.1%	9.3%	17.7%	21.4%	13.3%
Southwestern Electric Power Co	16.9%	17.3%	18.4%	24.6%	19.1%	31.4%	19.3%	18.8%	24.0%	18.5%
Southwestern Public Service Co	26.4%	22.6%	24.1%	29.0%	17.0%	25.9%	25.6%	20.0%	24.0%	18.3%
Texas-New Mexico Power Co.	22.5%	24.7%	25.1%	27.7%	28.9%	25.2%	27.5%	20.3%	24.5%	11.8%
Toledo Edison Co.	26.5%	11.6%	12.6%	13.8%	-7.2%	8.6%	4.3%	8.1%	1.1%	32.5%
Union Electric Co.	26.0%	30.0%	30.0%	28.3%	27.8%	28.2%	25.8%	27.9%	24.5%	17.6%
West Penn Power Co.	34.2%	33.5%	23.0%	29.5%	34.6%	24.9%	26.1%	34.4%	N/A	N/A
Wisconsin Electric Power Co.	11.9%	13.4%	12.6%	15.2%	17.6%	11.1%	11.0%	11.4%	5.9%	14.8%
Wisconsin Gas LLC	20.0%	23.9%	23.8%	21.4%	N/A	N/A	N/A	N/A	N/A	N/A
Wisconsin Power and Light Co	23.3%	34.4%	27.5%	25.8%	28.3%	27.4%	32.5%	27.0%	30.7%	31.1%
Wisconsin Public Service Corp.	32.5%	28.4%	17.7%	20.9%	21.6%	16.2%	27.9%	36.4%	37.9%	31.6%
Median	**23.3%**	**24.3%**	**23.9%**	**24.6%**	**23.0%**	**23.9%**	**25.1%**	**25.2%**	**21.7%**	**23.6%**
Average	**23.5%**	**23.5%**	**23.6%**	**23.4%**	**23.5%**	**23.2%**	**23.6%**	**25.2%**	**22.4%**	**23.2%**
Consolidated Edison Co. of NY	**19.5%**	**20.7%**	**22.0%**	**25.2%**	**23.8%**	**22.4%**	**28.3%**	**23.9%**	**18.1%**	**17.1%**

Source: SNL Financial.

	Cash Flow from Operations Interest Coverage									
Company Name	**2017**	**2016**	**2015**	**2014**	**2013**	**2012**	**2011**	**2010**	**2009**	**2008**
AEP Texas Inc	5.7x	5.3x	4.1x	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Alabama Power Co.	8.0x	7.1x	8.3x	7.9x	7.7x	6.7x	7.4x	7.0x	5.4x	6.0x
ALLETE Inc.	7.1x	5.8x	6.8x	6.2x	5.8x	6.3x	6.2x	6.4x	6.3x	6.8x
Ameren Illinois	6.5x	7.1x	6.2x	5.1x	4.8x	4.8x	4.2x	5.9x	4.9x	N/A
Appalachian Power Co.	5.6x	5.7x	5.4x	4.2x	4.8x	4.4x	3.2x	3.7x	3.2x	1.8x
Arizona Public Service Co.	7.5x	7.4x	7.8x	6.7x	8.6x	7.6x	6.0x	4.7x	6.1x	5.3x
Black Hills Power Inc.	5.1x	5.1x	4.5x	4.3x	4.6x	5.1x	4.2x	5.4x	5.9x	6.5x
Cleveland Elec Illuminating Co	3.4x	2.6x	2.7x	2.4x	2.3x	2.8x	2.5x	3.3x	2.1x	4.3x
Connecticut Light & Power Co.	6.6x	5.8x	3.4x	6.0x	5.8x	4.2x	4.6x	6.6x	5.4x	4.5x
Consumers Energy Co.	7.2x	6.6x	7.7x	6.4x	5.7x	6.2x	5.6x	4.2x	4.2x	5.4x
Duke Energy Carolinas LLC	7.4x	7.4x	7.3x	7.7x	8.1x	6.9x	6.7x	6.5x	6.3x	6.9x
Duke Energy Florida LLC	5.6x	6.3x	7.2x	8.0x	7.4x	4.1x	5.1x	5.8x	6.1x	3.9x
Duke Energy Indiana, LLC	6.0x	6.6x	6.5x	7.4x	6.5x	7.0x	6.0x	6.8x	5.2x	6.3x
Duke Energy Kentucky Inc.	8.0x	7.2x	8.1x	5.9x	6.4x	5.8x	6.6x	7.3x	6.5x	6.1x
Duke Energy Ohio Inc.	6.5x	6.2x	8.3x	6.6x	7.9x	6.3x	8.3x	8.2x	7.0x	9.0x
Duke Energy Progress LLC	7.0x	6.7x	7.1x	8.2x	8.2x	6.3x	7.6x	8.7x	7.7x	7.4x
El Paso Electric Co.	5.1x	5.3x	5.5x	6.6x	6.7x	6.9x	7.3x	6.7x	5.6x	5.8x
Entergy Arkansas LLC	5.4x	6.2x	6.8x	5.7x	6.6x	5.6x	6.6x	6.4x	5.4x	7.1x
Entergy Louisiana LLC	5.8x	6.5x	5.3x	7.1x	7.3x	5.9x	5.3x	9.6x	3.1x	13.0x
Entergy Mississippi LLC	6.2x	6.6x	5.7x	6.0x	5.1x	4.9x	3.7x	4.9x	3.6x	4.4x
Entergy Texas Inc.	4.3x	4.6x	3.8x	4.0x	4.8x	4.7x	3.7x	3.7x	1.4x	-0.6x
Georgia Power Co.	7.5x	6.8x	8.0x	8.1x	8.3x	8.1x	8.2x	5.7x	5.6x	6.6x
Gulf Power Co.	8.8x	7.9x	9.5x	7.5x	7.9x	8.5x	6.2x	7.0x	6.2x	6.0x
Hawaiian Electric Co.	6.0x	7.0x	6.6x	6.2x	5.6x	5.1x	5.1x	6.8x	5.4x	5.7x
Idaho Power Co.	5.8x	5.3x	5.4x	5.6x	5.2x	4.9x	5.4x	5.4x	5.3x	3.5x
Indiana Michigan Power Co.	7.1x	6.0x	8.0x	7.4x	6.9x	6.0x	6.6x	4.9x	8.4x	5.7x
Interstate Power & Light Co.	5.4x	6.0x	6.1x	5.5x	6.4x	5.1x	4.6x	5.8x	7.7x	6.4x
Jersey Cntrl Power & Light Co.	5.6x	4.4x	3.4x	3.3x	3.9x	4.2x	3.6x	5.4x	4.6x	5.8x
Kentucky Power Co.	4.3x	3.4x	3.9x	5.6x	4.3x	3.8x	3.8x	3.5x	4.3x	2.7x
Kentucky Utilities Co.	7.8x	7.3x	7.8x	9.7x	8.2x	8.1x	7.4x	5.6x	4.8x	N/A
Louisville Gas & Electric Co.	8.5x	7.6x	8.8x	10.2x	12.2x	8.9x	7.5x	7.0x	5.3x	N/A
Madison Gas and Electric Co.	7.9x	7.5x	7.4x	9.5x	8.3x	8.6x	7.1x	8.8x	7.3x	7.5x
Metropolitan Edison Co.	6.4x	5.9x	4.9x	4.3x	4.5x	4.9x	3.3x	5.7x	4.6x	4.9x
Mississippi Power Co.	1.7x	6.3x	66.0x	15.8x	16.2x	8.7x	12.5x	7.1x	5.4x	9.4x
Monongahela Power Co.	5.7x	5.1x	4.9x	4.0x	6.8x	7.0x	4.8x	4.9x	2.5x	2.5x
North Shore Gas Co.	8.3x	10.9x	8.5x	2.8x	8.3x	6.9x	7.2x	8.0x	4.8x	6.5x
Northern States Power Co - WI	7.0x	6.7x	7.6x	7.3x	7.1x	7.2x	7.7x	6.6x	7.2x	5.8x
Northern States Power Co. - MN	7.5x	7.5x	7.4x	7.4x	6.9x	6.3x	6.6x	6.6x	5.9x	5.9x
NorthWestern Corp.	4.7x	4.4x	4.7x	4.2x	4.3x	4.2x	4.5x	4.5x	3.3x	4.2x
NSTAR Electric Co.	7.3x	8.4x	8.1x	7.9x	9.7x	9.7x	10.8x	10.2x	7.8x	5.9x
Ohio Edison Co.	6.7x	4.4x	5.3x	5.0x	3.7x	4.8x	4.4x	4.5x	3.8x	6.3x
Ohio Power Co.	7.9x	7.3x	6.3x	5.8x	5.8x	5.7x	5.7x	5.6x	6.0x	3.6x
Oklahoma Gas and Electric Co.	5.7x	5.9x	5.7x	6.2x	6.1x	5.9x	5.7x	5.9x	6.8x	5.6x
Pennsylvania Electric Co.	5.0x	5.3x	4.1x	3.7x	3.6x	2.9x	4.0x	3.0x	2.7x	5.4x
Pennsylvania Power Co.	7.6x	7.3x	7.0x	5.6x	5.3x	4.8x	5.2x	7.1x	N/A	N/A
Peoples Gas Light & Coke Co.	4.4x	7.5x	7.4x	6.4x	7.2x	8.8x	N/A	N/A	N/A	N/A
Piedmont Natural Gas Co.	7.0x	2.7x	6.0x	8.2x	14.6x	14.7x	7.9x	6.4x	6.7x	5.3x
Portland General Electric Co.	6.1x	5.9x	6.0x	7.0x	5.8x	5.3x	5.2x	4.5x	4.1x	5.1x
Potomac Edison Co.	6.5x	7.6x	5.6x	5.8x	9.0x	6.2x	6.9x	2.6x	N/A	N/A
PPL Electric Utilities Corp.	7.7x	7.7x	6.3x	5.5x	5.4x	4.5x	4.1x	5.3x	5.8x	6.7x
Public Service Co. of CO	7.4x	7.4x	8.0x	8.5x	8.6x	5.1x	6.2x	6.0x	4.8x	6.5x
Public Service Co. of NH	6.3x	7.7x	8.3x	7.5x	5.3x	5.3x	6.1x	5.6x	5.5x	4.2x
Public Service Co. of NM	5.4x	4.5x	4.5x	5.3x	3.8x	4.0x	4.6x	4.0x	2.5x	3.2x
Public Service Co. of OK	5.6x	5.0x	6.8x	5.0x	4.7x	5.9x	7.0x	3.6x	4.1x	4.4x
Southern California Edison Co.	7.7x	7.2x	9.9x	7.8x	7.4x	8.7x	8.6x	9.6x	10.8x	4.8x
Southern Company Gas	5.5x	4.8x	7.5x	6.6x	5.9x	5.9x	4.4x	5.4x	6.5x	3.9x
Southwestern Electric Power Co	4.6x	5.0x	4.7x	5.4x	4.2x	8.8x	5.7x	5.1x	6.6x	4.2x
Southwestern Public Service Co	7.0x	5.6x	5.7x	6.5x	4.1x	5.5x	5.2x	4.1x	4.2x	4.2x
Texas-New Mexico Power Co.	4.6x	4.6x	4.9x	4.9x	4.9x	4.0x	3.9x	3.0x	3.9x	3.1x
Toledo Edison Co.	3.9x	2.3x	2.3x	2.8x	0.1x	2.3x	1.6x	2.2x	1.2x	6.8x
Union Electric Co.	6.0x	6.7x	6.6x	6.5x	6.0x	6.1x	5.9x	6.2x	5.3x	4.6x
West Penn Power Co.	9.6x	10.5x	7.9x	9.2x	11.4x	8.0x	7.9x	6.1x	N/A	N/A
Wisconsin Electric Power Co.	6.8x	7.4x	7.0x	8.3x	8.9x	6.3x	7.3x	5.8x	2.9x	6.0x
Wisconsin Gas LLC	7.3x	10.4x	12.5x	9.9x	N/A	N/A	N/A	N/A	N/A	N/A
Wisconsin Power and Light Co	6.2x	7.5x	6.0x	6.1x	6.6x	6.5x	6.1x	5.5x	5.8x	6.0x
Wisconsin Public Service Corp.	9.7x	9.7x	5.9x	5.8x	7.0x	4.7x	6.1x	7.0x	7.3x	7.8x
Median	**6.4x**	**6.5x**	**6.5x**	**6.2x**	**6.4x**	**5.9x**	**5.9x**	**5.8x**	**5.4x**	**5.7x**
Average	**6.4x**	**6.4x**	**7.3x**	**6.5x**	**6.6x**	**6.1x**	**5.9x**	**5.8x**	**5.2x**	**5.5x**
Consolidated Edison Co. of NY	**5.2x**	**5.3x**	**5.7x**	**6.4x**	**6.0x**	**5.2x**	**6.2x**	**5.3x**	**4.2x**	**4.2x**

Source: SNL Financial.

	Total Debt to EBITDA									
Company Name	**2017**	**2016**	**2015**	**2014**	**2013**	**2012**	**2011**	**2010**	**2009**	**2008**
AEP Texas Inc	4.2x	4.2x	4.4x	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Alabama Power Co.	2.9x	2.8x	2.9x	2.9x	2.7x	2.7x	2.7x	2.8x	3.0x	3.1x
ALLETE Inc.	3.5x	3.6x	4.0x	3.9x	3.7x	3.6x	3.3x	3.3x	3.7x	2.9x
Ameren Illinois	3.1x	3.0x	3.2x	3.1x	2.8x	3.0x	2.5x	2.6x	3.3x	N/A
Appalachian Power Co.	3.8x	3.6x	3.7x	4.1x	4.9x	4.0x	5.4x	5.2x	5.5x	5.3x
Arizona Public Service Co.	2.9x	2.8x	2.5x	2.5x	2.4x	2.4x	2.7x	2.9x	3.3x	3.5x
Black Hills Power Inc.	2.9x	2.8x	2.8x	3.4x	3.0x	3.1x	3.3x	3.4x	5.3x	3.5x
Cleveland Elec Illuminating Co	3.9x	5.8x	5.7x	6.4x	5.3x	6.6x	6.0x	6.1x	11.8x	3.2x
Connecticut Light & Power Co.	3.3x	3.1x	3.6x	3.9x	4.1x	4.9x	4.3x	3.8x	4.1x	5.1x
Consumers Energy Co.	2.9x	3.1x	3.1x	3.0x	2.8x	2.9x	2.9x	3.1x	3.5x	3.3x
Duke Energy Carolinas LLC	2.8x	2.7x	2.4x	2.5x	2.7x	3.1x	3.5x	2.9x	3.4x	3.2x
Duke Energy Florida LLC	4.4x	4.0x	3.1x	3.0x	4.8x	6.2x	5.4x	3.3x	3.2x	4.4x
Duke Energy Indiana, LLC	3.0x	2.9x	3.4x	3.4x	3.5x	9.3x	4.9x	3.6x	3.6x	3.2x
Duke Energy Kentucky Inc.	3.7x	3.2x	2.8x	3.0x	2.6x	3.2x	3.1x	2.5x	3.2x	3.0x
Duke Energy Ohio Inc.	3.4x	3.2x	3.2x	4.9x	4.1x	3.2x	3.5x	12.6x	9.9x	2.3x
Duke Energy Progress LLC	3.4x	3.4x	3.5x	3.5x	3.4x	4.1x	2.7x	2.1x	2.4x	2.2x
El Paso Electric Co.	3.9x	4.0x	4.1x	3.8x	3.4x	3.4x	2.8x	2.9x	3.5x	3.3x
Entergy Arkansas LLC	3.9x	3.6x	4.3x	3.9x	3.4x	3.2x	2.7x	2.7x	3.4x	3.5x
Entergy Louisiana LLC	3.7x	3.7x	3.3x	3.5x	4.0x	5.1x	4.7x	2.7x	3.2x	2.8x
Entergy Mississippi LLC	3.4x	3.1x	3.1x	3.5x	3.6x	4.6x	3.3x	3.0x	3.3x	3.2x
Entergy Texas Inc.	4.9x	4.2x	5.0x	4.7x	5.7x	6.3x	5.6x	6.0x	6.0x	5.0x
Georgia Power Co.	3.2x	3.1x	3.1x	3.0x	3.0x	3.1x	3.0x	3.5x	3.5x	3.0x
Gulf Power Co.	3.1x	2.9x	3.2x	3.3x	3.2x	3.3x	3.7x	3.5x	3.9x	3.4x
Hawaiian Electric Co.	2.9x	2.7x	2.7x	2.6x	3.0x	3.1x	2.8x	3.1x	3.1x	2.7x
Idaho Power Co.	3.4x	3.9x	3.7x	3.8x	3.5x	3.8x	4.7x	4.6x	4.1x	4.4x
Indiana Michigan Power Co.	4.2x	3.7x	3.2x	3.4x	3.3x	3.8x	3.7x	3.7x	3.6x	3.9x
Interstate Power & Light Co.	4.3x	4.2x	4.0x	4.2x	3.7x	3.5x	3.4x	3.0x	3.4x	2.7x
Jersey Cntrl Power & Light Co.	4.2x	5.7x	7.0x	6.3x	4.6x	4.8x	4.2x	3.2x	3.7x	3.2x
Kentucky Power Co.	4.7x	4.3x	5.2x	4.5x	5.0x	3.8x	3.5x	3.9x	4.6x	4.8x
Kentucky Utilities Co.	3.1x	3.0x	3.4x	3.6x	3.6x	3.9x	3.3x	3.7x	4.2x	N/A
Louisville Gas & Electric Co.	3.1x	3.1x	3.4x	3.3x	3.1x	2.9x	2.8x	3.4x	3.3x	N/A
Madison Gas and Electric Co.	2.3x	2.1x	2.2x	2.1x	2.2x	2.2x	2.3x	2.3x	2.3x	2.4x
Metropolitan Edison Co.	2.7x	3.6x	4.2x	5.1x	14.1x	5.2x	4.8x	4.0x	4.4x	3.4x
Mississippi Power Co.	-0.7x	38.9x	56.6x	-5.2x	-3.1x	7.4x	5.5x	3.1x	2.1x	1.9x
Monongahela Power Co.	4.9x	4.5x	4.7x	4.6x	317.4x	4.5x	8.4x	4.6x	7.4x	7.5x
North Shore Gas Co.	3.5x	3.1x	3.0x	3.9x	3.5x	3.5x	2.8x	3.2x	4.8x	3.8x
Northern States Power Co - WI	2.9x	3.0x	2.8x	2.9x	2.7x	2.9x	2.4x	2.6x	2.4x	2.7x
Northern States Power Co. - MN	2.9x	3.0x	3.6x	3.2x	3.2x	3.1x	2.8x	2.9x	2.7x	2.8x
NorthWestern Corp.	4.9x	5.2x	4.8x	6.3x	4.6x	4.2x	4.1x	4.2x	4.2x	3.5x
NSTAR Electric Co.	3.2x	3.0x	2.5x	2.7x	2.8x	3.5x	2.9x	3.2x	2.5x	2.7x
Ohio Edison Co.	1.7x	2.3x	2.2x	2.6x	2.1x	3.2x	3.0x	3.2x	3.4x	2.6x
Ohio Power Co.	2.2x	2.3x	3.1x	3.3x	2.3x	3.2x	2.8x	2.6x	3.3x	4.0x
Oklahoma Gas and Electric Co.	3.5x	3.0x	3.2x	3.3x	3.0x	2.7x	2.9x	2.8x	2.7x	3.6x
Pennsylvania Electric Co.	3.3x	4.3x	4.9x	6.5x	5.6x	5.6x	5.5x	5.0x	5.2x	4.1x
Pennsylvania Power Co.	1.9x	2.9x	2.7x	3.4x	2.1x	2.4x	2.3x	2.3x	N/A	N/A
Peoples Gas Light & Coke Co.	3.3x	3.5x	3.2x	4.8x	3.8x	3.9x	N/A	N/A	N/A	N/A
Piedmont Natural Gas Co.	5.6x	3.7x	4.4x	4.2x	4.6x	4.1x	3.0x	2.6x	3.1x	3.6x
Portland General Electric Co.	3.3x	3.5x	3.5x	4.0x	4.0x	3.0x	3.3x	3.5x	4.0x	3.6x
Potomac Edison Co.	3.6x	3.3x	3.4x	3.7x	2.9x	3.6x	4.3x	4.1x	N/A	N/A
PPL Electric Utilities Corp.	3.1x	3.2x	3.6x	3.4x	3.8x	4.1x	3.4x	3.4x	3.2x	3.6x
Public Service Co. of CO	3.3x	3.2x	3.1x	3.4x	3.1x	3.1x	3.1x	3.2x	3.2x	2.8x
Public Service Co. of NH	3.1x	3.2x	3.8x	3.5x	3.5x	3.7x	4.0x	4.1x	5.1x	5.2x
Public Service Co. of NM	3.9x	4.4x	7.3x	3.9x	3.7x	3.4x	4.2x	4.2x	5.3x	13.7x
Public Service Co. of OK	4.7x	4.0x	4.1x	4.1x	3.4x	2.9x	2.8x	3.7x	3.4x	3.2x
Southern California Edison Co.	3.2x	2.5x	2.6x	2.5x	3.0x	2.3x	2.5x	2.4x	2.2x	3.5x
Southern Company Gas	5.8x	6.3x	4.2x	3.3x	4.7x	4.9x	7.7x	4.1x	4.0x	4.0x
Southwestern Electric Power Co	5.0x	5.1x	4.1x	4.3x	4.1x	4.6x	4.6x	4.5x	4.6x	4.4x
Southwestern Public Service Co	3.6x	3.5x	3.6x	3.3x	3.8x	3.2x	3.2x	3.2x	3.2x	4.8x
Texas-New Mexico Power Co.	3.0x	2.7x	2.8x	2.8x	2.8x	2.7x	2.7x	3.0x	3.7x	5.3x
Toledo Edison Co.	2.3x	3.5x	3.6x	5.1x	3.8x	5.8x	4.9x	4.8x	8.4x	2.6x
Union Electric Co.	2.9x	2.9x	3.0x	3.0x	2.8x	2.9x	3.6x	3.3x	4.0x	4.2x
West Penn Power Co.	2.5x	2.6x	2.9x	3.5x	2.6x	3.5x	3.4x	2.9x	N/A	N/A
Wisconsin Electric Power Co.	5.9x	5.5x	5.5x	5.5x	5.6x	5.8x	6.6x	5.3x	3.9x	3.6x
Wisconsin Gas LLC	3.8x	3.7x	3.8x	3.1x	N/A	N/A	N/A	N/A	N/A	N/A
Wisconsin Power and Light Co	3.5x	3.0x	3.0x	2.9x	2.9x	2.9x	2.4x	2.6x	3.2x	2.4x
Wisconsin Public Service Corp.	3.3x	3.5x	3.9x	3.3x	3.3x	2.9x	2.6x	2.4x	2.6x	2.7x
Median	**3.3x**	**3.3x**	**3.4x**	**3.4x**	**3.4x**	**3.5x**	**3.3x**	**3.2x**	**3.5x**	**3.4x**
Average	**3.5x**	**4.0x**	**4.4x**	**3.6x**	**8.5x**	**3.9x**	**3.7x**	**3.6x**	**4.0x**	**3.7x**
Consolidated Edison Co. of NY	**3.7x**	**3.8x**	**3.8x**	**3.7x**	**3.7x**	**3.4x**	**3.4x**	**3.6x**	**3.9x**	**3.9x**

Source: SNL Financial.

	EBITDA to Interest Expense									
Company Name	**2017**	**2016**	**2015**	**2014**	**2013**	**2012**	**2011**	**2010**	**2009**	**2008**
AEP Texas Inc	6.2x	5.6x	5.4x	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Alabama Power Co.	8.6x	8.3x	8.7x	9.0x	8.9x	7.9x	7.6x	7.3x	6.8x	6.8x
ALLETE Inc.	6.3x	6.2x	6.1x	6.4x	6.0x	6.2x	6.0x	6.1x	5.6x	7.9x
Ameren Illinois	6.4x	6.2x	5.9x	6.4x	4.6x	4.5x	4.9x	4.8x	3.7x	N/A
Appalachian Power Co.	5.8x	6.1x	5.8x	4.7x	4.5x	4.8x	3.6x	3.5x	3.3x	3.0x
Arizona Public Service Co.	8.3x	8.1x	8.3x	7.5x	7.5x	6.9x	5.9x	5.7x	5.1x	5.3x
Black Hills Power Inc.	5.8x	5.7x	5.6x	4.9x	4.7x	5.0x	5.1x	4.9x	5.5x	5.9x
Cleveland Elec Illuminating Co	3.8x	2.4x	2.7x	2.3x	2.7x	2.2x	2.4x	2.4x	1.4x	5.0x
Connecticut Light & Power Co.	6.7x	6.4x	5.7x	5.1x	5.5x	4.5x	4.8x	5.0x	4.4x	4.0x
Consumers Energy Co.	7.7x	7.5x	7.6x	7.2x	7.1x	6.4x	5.8x	5.5x	4.5x	5.6x
Duke Energy Carolinas LLC	8.8x	8.5x	8.4x	8.2x	8.6x	7.4x	7.5x	7.3x	6.9x	6.9x
Duke Energy Florida LLC	5.8x	7.6x	8.2x	8.2x	5.9x	3.4x	3.8x	5.5x	6.2x	5.3x
Duke Energy Indiana, LLC	7.3x	7.1x	6.2x	6.7x	6.5x	3.0x	5.6x	7.1x	6.0x	7.2x
Duke Energy Kentucky Inc.	8.6x	8.0x	9.4x	7.2x	8.3x	6.1x	6.4x	8.4x	6.5x	6.4x
Duke Energy Ohio Inc.	6.7x	6.9x	6.8x	5.3x	7.3x	7.9x	7.0x	1.9x	2.2x	10.3x
Duke Energy Progress LLC	7.6x	8.0x	8.2x	7.5x	8.3x	6.1x	8.8x	9.3x	8.1x	8.0x
El Paso Electric Co.	5.2x	5.4x	5.5x	6.5x	6.3x	6.8x	7.1x	7.1x	5.5x	6.1x
Entergy Arkansas LLC	6.8x	7.5x	6.3x	7.6x	7.9x	8.5x	8.9x	8.1x	5.9x	5.9x
Entergy Louisiana LLC	6.7x	6.1x	5.9x	6.3x	5.8x	4.8x	4.9x	6.7x	6.9x	6.4x
Entergy Mississippi LLC	7.9x	6.7x	6.0x	5.4x	5.2x	4.7x	5.8x	5.3x	5.2x	4.9x
Entergy Texas Inc.	3.9x	4.4x	3.5x	3.6x	3.1x	2.8x	3.3x	3.0x	2.7x	3.1x
Georgia Power Co.	9.0x	9.2x	9.5x	9.6x	9.0x	8.6x	8.7x	6.7x	6.3x	7.3x
Gulf Power Co.	8.6x	9.7x	9.2x	8.3x	7.6x	7.0x	6.3x	7.3x	8.0x	6.9x
Hawaiian Electric Co.	7.3x	7.6x	7.3x	7.4x	7.2x	6.4x	6.6x	5.8x	6.4x	6.9x
Idaho Power Co.	6.1x	5.6x	5.7x	5.3x	5.8x	5.5x	4.5x	4.7x	4.8x	4.5x
Indiana Michigan Power Co.	6.5x	7.2x	8.1x	7.2x	6.7x	5.3x	5.8x	5.5x	5.9x	5.5x
Interstate Power & Light Co.	5.5x	6.0x	5.4x	5.2x	5.6x	5.2x	5.1x	5.6x	6.0x	6.8x
Jersey Cntrl Power & Light Co.	4.1x	3.1x	2.4x	2.7x	4.2x	3.9x	4.0x	4.7x	4.3x	5.4x
Kentucky Power Co.	4.2x	4.5x	3.9x	5.1x	3.4x	4.3x	4.3x	3.9x	3.5x	3.3x
Kentucky Utilities Co.	8.1x	8.0x	8.4x	8.3x	9.0x	7.1x	7.9x	6.4x	5.4x	N/A
Louisville Gas & Electric Co.	8.6x	8.2x	9.3x	10.0x	13.1x	9.5x	9.0x	8.3x	7.3x	N/A
Madison Gas and Electric Co.	9.2x	9.0x	8.7x	9.7x	9.5x	8.3x	7.8x	9.1x	8.2x	7.9x
Metropolitan Edison Co.	6.6x	5.2x	4.4x	3.5x	1.2x	3.5x	3.9x	4.1x	3.4x	5.5x
Mississippi Power Co.	-68.6x	1.1x	7.9x	-10.2x	-19.6x	6.1x	11.2x	10.4x	10.4x	12.8x
Monongahela Power Co.	4.1x	4.8x	4.9x	4.5x	0.1x	6.8x	2.8x	3.3x	2.2x	2.9x
North Shore Gas Co.	10.3x	10.6x	10.5x	9.4x	9.2x	7.1x	6.9x	6.4x	4.0x	5.2x
Northern States Power Co - WI	8.3x	7.5x	8.2x	8.5x	7.7x	7.5x	7.4x	6.7x	6.7x	6.5x
Northern States Power Co. - MN	8.1x	7.7x	6.8x	7.0x	7.3x	6.7x	6.5x	6.3x	6.3x	6.2x
NorthWestern Corp.	4.7x	4.3x	4.5x	4.0x	4.1x	4.4x	4.0x	4.0x	3.6x	4.0x
NSTAR Electric Co.	9.4x	8.7x	11.2x	9.9x	9.8x	7.9x	9.4x	9.0x	10.5x	8.6x
Ohio Edison Co.	8.3x	5.3x	5.5x	4.5x	5.5x	4.2x	4.5x	4.7x	4.1x	6.2x
Ohio Power Co.	8.0x	6.9x	5.5x	5.4x	6.6x	5.7x	6.5x	6.6x	6.4x	4.6x
Oklahoma Gas and Electric Co.	6.3x	6.2x	5.6x	5.8x	6.1x	6.0x	6.4x	6.2x	6.1x	5.4x
Pennsylvania Electric Co.	5.6x	4.3x	3.7x	2.6x	3.1x	3.0x	3.1x	3.5x	4.2x	4.3x
Pennsylvania Power Co.	8.8x	5.9x	6.2x	4.9x	7.4x	5.6x	5.8x	6.1x	N/A	N/A
Peoples Gas Light & Coke Co.	9.3x	8.1x	8.5x	6.8x	8.2x	8.2x	N/A	N/A	N/A	N/A
Piedmont Natural Gas Co.	5.5x	7.8x	6.4x	7.7x	14.7x	16.3x	7.7x	8.7x	7.6x	5.7x
Portland General Electric Co.	6.2x	6.0x	5.6x	6.6x	4.7x	5.2x	4.9x	4.7x	4.2x	4.7x
Potomac Edison Co.	6.1x	6.9x	7.4x	6.8x	9.4x	7.5x	5.6x	4.0x	N/A	N/A
PPL Electric Utilities Corp.	7.5x	7.5x	6.0x	6.1x	5.8x	4.9x	5.2x	4.3x	4.0x	4.7x
Public Service Co. of CO	7.8x	7.8x	7.8x	8.0x	7.6x	6.8x	6.2x	6.5x	6.1x	6.6x
Public Service Co. of NH	7.9x	7.6x	7.4x	7.3x	6.9x	5.9x	6.1x	5.4x	4.4x	3.7x
Public Service Co. of NM	5.2x	4.4x	2.7x	4.7x	4.6x	4.8x	4.0x	4.1x	3.2x	1.5x
Public Service Co. of OK	5.7x	6.6x	5.5x	5.4x	5.9x	6.0x	6.3x	4.6x	4.9x	3.9x
Southern California Edison Co.	6.4x	8.1x	7.9x	8.2x	6.7x	8.0x	7.8x	7.5x	7.7x	6.8x
Southern Company Gas	6.6x	5.9x	6.7x	8.3x	6.2x	5.5x	4.7x	6.0x	6.4x	5.5x
Southwestern Electric Power Co	4.3x	4.5x	4.9x	4.1x	4.1x	5.4x	5.3x	4.9x	5.0x	3.9x
Southwestern Public Service Co	6.2x	5.8x	5.5x	5.7x	4.8x	5.4x	5.1x	4.8x	4.1x	3.7x
Texas-New Mexico Power Co.	5.4x	5.4x	5.5x	5.1x	4.7x	4.4x	3.9x	3.3x	3.3x	3.4x
Toledo Edison Co.	4.7x	3.0x	3.0x	2.6x	3.2x	2.5x	3.0x	3.0x	2.7x	6.9x
Union Electric Co.	6.7x	6.5x	6.2x	6.4x	6.4x	6.2x	5.3x	5.6x	4.4x	4.9x
West Penn Power Co.	10.1x	10.9x	10.5x	7.9x	11.6x	8.0x	7.7x	5.1x	N/A	N/A
Wisconsin Electric Power Co.	8.3x	8.7x	8.7x	8.8x	8.0x	8.3x	8.6x	7.9x	8.2x	9.2x
Wisconsin Gas LLC	8.4x	10.7x	12.6x	13.2x	N/A	N/A	N/A	N/A	N/A	N/A
Wisconsin Power and Light Co	6.4x	6.3x	6.0x	6.9x	6.7x	6.9x	6.5x	6.4x	4.9x	6.5x
Wisconsin Public Service Corp.	8.3x	8.7x	7.0x	6.9x	8.5x	7.9x	7.0x	6.9x	6.5x	7.9x
Median	**6.7x**	**6.8x**	**6.2x**	**6.6x**	**6.4x**	**6.1x**	**5.8x**	**5.6x**	**5.4x**	**5.6x**
Average	**5.8x**	**6.7x**	**6.7x**	**6.3x**	**6.1x**	**6.1x**	**5.9x**	**5.8x**	**5.4x**	**5.8x**
Consolidated Edison Co. of NY	**5.8x**	**5.6x**	**5.6x**	**5.8x**	**5.8x**	**5.5x**	**5.4x**	**5.0x**	**4.5x**	**4.8x**

Source: SNL Financial.

	Capital Expenditures to Net PP&E									
Company Name	**2017**	**2016**	**2015**	**2014**	**2013**	**2012**	**2011**	**2010**	**2009**	**2008**
AEP Texas Inc	14.5%	11.1%	11.3%	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Alabama Power Co.	9.9%	7.2%	8.0%	9.2%	7.4%	6.0%	6.9%	6.5%	9.1%	11.6%
ALLETE Inc.	5.5%	7.1%	7.8%	17.4%	12.7%	17.3%	12.1%	13.8%	19.6%	21.7%
Ameren Illinois	13.0%	12.4%	13.4%	13.5%	12.5%	8.7%	7.4%	6.3%	10.2%	N/A
Appalachian Power Co.	8.0%	6.6%	6.8%	5.4%	4.2%	5.8%	5.9%	7.2%	7.7%	10.3%
Arizona Public Service Co.	10.5%	9.9%	9.2%	8.2%	9.5%	8.7%	9.0%	8.0%	8.2%	10.2%
Black Hills Power Inc.	8.4%	9.4%	6.8%	10.3%	9.8%	5.8%	6.0%	11.9%	22.3%	23.5%
Cleveland Elec Illuminating Co	5.8%	6.1%	6.2%	5.1%	6.3%	8.1%	6.0%	6.8%	7.1%	9.7%
Connecticut Light & Power Co.	10.0%	8.0%	7.3%	7.6%	6.7%	7.3%	7.3%	6.8%	8.2%	16.7%
Consumers Energy Co.	10.2%	11.0%	11.0%	12.2%	11.4%	11.2%	8.7%	8.6%	9.1%	9.3%
Duke Energy Carolinas LLC	9.1%	8.3%	7.5%	7.6%	7.4%	8.4%	10.5%	11.4%	11.6%	14.0%
Duke Energy Florida LLC	11.2%	13.4%	9.7%	7.0%	9.5%	8.6%	7.8%	10.4%	14.9%	17.7%
Duke Energy Indiana, LLC	8.2%	7.6%	7.2%	7.1%	6.4%	8.6%	12.7%	15.9%	14.9%	12.7%
Duke Energy Kentucky Inc.	13.7%	8.6%	6.0%	5.4%	4.2%	7.3%	5.6%	6.3%	7.2%	6.7%
Duke Energy Ohio Inc.	11.4%	8.6%	7.6%	6.5%	5.3%	6.3%	6.2%	5.7%	5.5%	7.3%
Duke Energy Progress LLC	9.0%	9.4%	9.4%	8.2%	11.5%	11.7%	12.3%	12.6%	8.5%	8.1%
El Paso Electric Co.	6.5%	8.0%	10.4%	11.1%	10.5%	9.6%	9.1%	9.1%	12.0%	12.5%
Entergy Arkansas LLC	10.7%	14.0%	10.7%	9.7%	9.2%	7.1%	8.2%	6.6%	7.7%	8.7%
Entergy Louisiana LLC	12.8%	12.8%	7.8%	7.2%	11.5%	13.2%	8.3%	9.2%	9.9%	13.2%
Entergy Mississippi LLC	13.6%	10.9%	8.8%	7.0%	6.7%	7.1%	7.6%	10.3%	6.5%	7.9%
Entergy Texas Inc.	11.3%	11.8%	12.1%	8.0%	7.8%	8.1%	8.1%	8.0%	9.7%	14.0%
Georgia Power Co.	9.6%	7.9%	7.9%	8.2%	7.4%	7.7%	8.7%	10.9%	13.6%	11.1%
Gulf Power Co.	5.3%	4.7%	6.1%	9.5%	8.5%	9.7%	10.8%	10.3%	16.3%	17.1%
Hawaiian Electric Co.	10.4%	7.1%	8.2%	8.3%	10.0%	10.1%	6.9%	5.6%	9.4%	9.8%
Idaho Power Co.	6.7%	7.1%	7.4%	7.2%	6.8%	6.8%	10.0%	10.8%	8.7%	8.9%
Indiana Michigan Power Co.	10.7%	10.6%	8.8%	8.9%	10.1%	6.7%	6.8%	7.8%	8.1%	9.1%
Interstate Power & Light Co.	11.4%	12.7%	12.6%	11.5%	9.7%	8.0%	8.0%	10.3%	20.7%	15.9%
Jersey Cntrl Power & Light Co.	6.2%	8.2%	6.1%	5.5%	10.4%	7.8%	6.8%	5.8%	5.7%	6.3%
Kentucky Power Co.	5.3%	5.7%	6.7%	5.1%	7.4%	7.1%	5.6%	4.7%	5.6%	11.5%
Kentucky Utilities Co.	6.4%	5.3%	7.9%	9.7%	14.6%	9.5%	5.9%	8.3%	12.0%	N/A
Louisville Gas & Electric Co.	8.7%	8.8%	14.4%	15.4%	15.6%	8.9%	6.5%	7.5%	6.7%	N/A
Madison Gas and Electric Co.	8.1%	6.5%	5.8%	7.7%	10.3%	9.2%	6.5%	6.2%	8.3%	11.7%
Metropolitan Edison Co.	7.9%	6.7%	5.6%	6.6%	5.9%	6.5%	5.9%	6.9%	7.3%	8.4%
Mississippi Power Co.	12.1%	13.0%	14.6%	23.4%	33.2%	37.1%	34.0%	14.6%	7.2%	11.1%
Monongahela Power Co.	6.5%	6.4%	7.0%	7.1%	5.1%	8.2%	7.4%	5.4%	12.8%	18.8%
North Shore Gas Co.	9.0%	6.5%	9.3%	10.2%	11.5%	8.0%	5.5%	4.8%	5.7%	4.1%
Northern States Power Co - WI	10.5%	10.5%	13.8%	17.2%	14.0%	11.8%	11.7%	11.4%	9.9%	9.3%
Northern States Power Co. - MN	7.8%	9.1%	14.5%	10.6%	14.6%	12.3%	11.5%	15.4%	12.0%	14.9%
NorthWestern Corp.	6.3%	6.8%	7.0%	7.2%	8.6%	9.0%	8.5%	10.8%	9.6%	6.8%
NSTAR Electric Co.	8.7%	8.6%	8.3%	8.7%	9.4%	8.7%	8.8%	7.5%	7.9%	9.4%
Ohio Edison Co.	7.0%	6.8%	7.4%	6.0%	7.4%	9.4%	6.8%	7.3%	8.0%	10.0%
Ohio Power Co.	9.8%	7.8%	9.0%	9.5%	14.3%	5.1%	4.5%	4.9%	6.2%	10.6%
Oklahoma Gas and Electric Co.	9.9%	8.6%	7.6%	8.2%	12.1%	11.7%	15.3%	13.0%	13.5%	21.3%
Pennsylvania Electric Co.	7.9%	7.4%	6.0%	6.2%	7.2%	5.9%	5.9%	7.1%	8.0%	8.6%
Pennsylvania Power Co.	9.8%	9.5%	11.7%	7.9%	6.7%	6.0%	6.0%	7.4%	N/A	N/A
Peoples Gas Light & Coke Co.	14.4%	8.6%	11.5%	12.1%	10.8%	13.3%	N/A	N/A	N/A	N/A
Piedmont Natural Gas Co.	11.2%	11.0%	10.2%	11.5%	16.5%	17.1%	9.3%	8.2%	5.6%	8.1%
Portland General Electric Co.	8.0%	9.5%	11.0%	18.7%	14.1%	7.2%	7.3%	11.3%	18.5%	12.0%
Potomac Edison Co.	6.5%	6.6%	6.1%	8.5%	6.5%	7.7%	7.0%	5.0%	N/A	N/A
PPL Electric Utilities Corp.	14.6%	14.8%	16.4%	16.0%	17.8%	14.6%	12.7%	11.6%	9.0%	8.7%
Public Service Co. of CO	10.5%	8.7%	8.2%	9.6%	9.9%	8.7%	7.7%	6.2%	7.7%	10.7%
Public Service Co. of NH	11.8%	10.0%	10.8%	9.7%	7.5%	8.7%	10.7%	14.4%	14.7%	15.1%
Public Service Co. of NM	8.2%	11.7%	11.5%	9.5%	7.7%	6.6%	8.7%	8.3%	9.7%	11.3%
Public Service Co. of OK	6.8%	9.2%	9.7%	10.7%	8.2%	7.6%	5.0%	7.2%	6.8%	11.4%
Southern California Edison Co.	9.6%	9.9%	12.0%	11.7%	11.8%	13.7%	14.9%	15.2%	13.5%	11.4%
Southern Company Gas	12.9%	10.6%	9.8%	7.7%	8.5%	9.4%	5.4%	11.6%	11.5%	9.7%
Southwestern Electric Power Co	6.1%	6.6%	8.6%	8.7%	7.4%	10.3%	11.3%	9.5%	15.0%	19.4%
Southwestern Public Service Co	11.0%	10.9%	13.8%	14.8%	17.8%	13.4%	11.9%	12.9%	9.4%	9.0%
Texas-New Mexico Power Co.	13.5%	12.6%	13.9%	15.4%	12.0%	13.4%	10.5%	6.9%	9.1%	9.2%
Toledo Edison Co.	5.8%	6.2%	6.9%	4.5%	7.1%	9.2%	6.8%	8.0%	9.5%	12.2%
Union Electric Co.	6.6%	6.4%	5.6%	6.9%	6.2%	5.9%	5.5%	6.4%	9.2%	9.7%
West Penn Power Co.	10.3%	9.5%	8.1%	7.6%	7.5%	9.1%	10.1%	9.1%	N/A	N/A
Wisconsin Electric Power Co.	6.0%	4.8%	5.3%	5.9%	5.8%	6.3%	8.0%	8.1%	7.7%	8.9%
Wisconsin Gas LLC	9.9%	9.1%	16.7%	12.8%	N/A	N/A	N/A	N/A	N/A	N/A
Wisconsin Power and Light Co	13.0%	10.2%	8.4%	7.9%	8.8%	19.9%	10.4%	15.8%	20.5%	17.3%
Wisconsin Public Service Corp.	8.8%	8.5%	10.9%	10.3%	8.2%	7.6%	3.9%	3.6%	10.9%	12.4%
Median	**9.6%**	**8.6%**	**8.5%**	**8.5%**	**9.0%**	**8.7%**	**7.8%**	**8.1%**	**9.2%**	**10.7%**
Average	**9.4%**	**8.9%**	**9.3%**	**9.5%**	**9.9%**	**9.6%**	**8.7%**	**9.0%**	**10.4%**	**11.7%**
Consolidated Edison Co. of NY	**8.6%**	**8.6%**	**8.2%**	**7.6%**	**8.4%**	**7.2%**	**7.6%**	**8.3%**	**9.7%**	**11.2%**

Source: SNL Financial.

S&P Global
Ratings

RatingsDirect®

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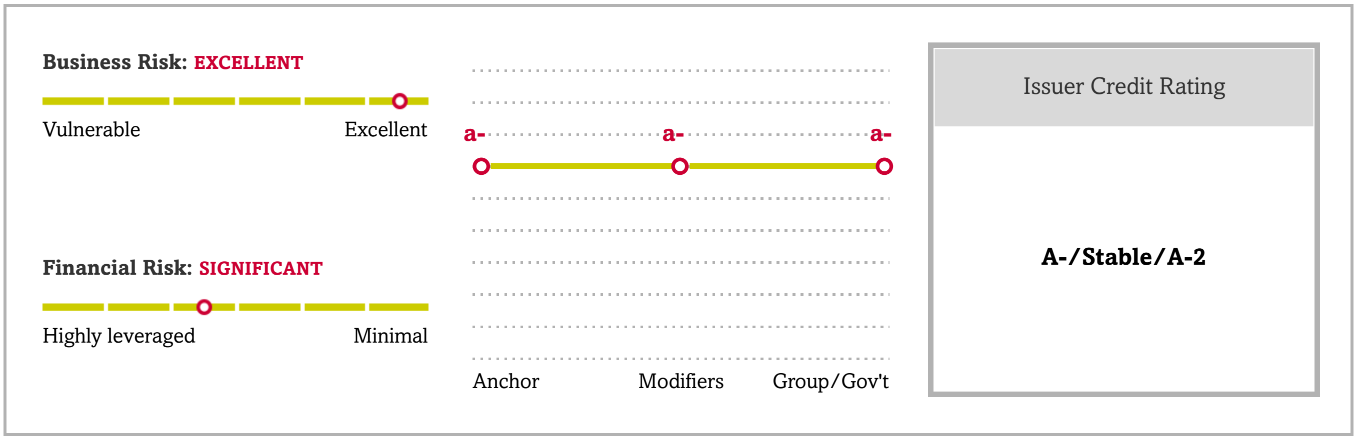
Summary:

Consolidated Edison Co. of New York Inc.



Rationale

Business Risk: Excellent

- Consolidated Edison Co. of New York (CECONY) is a fully regulated, mostly low-risk, electric, gas and steam transmission and distribution utility.
- We view the company's overall management of regulatory risk in New York as generally consistent with peers.
- A large and diverse customer base supports stable cash flows.
- We expect the company's implementation of the Reforming the Energy Vison (REV) in New York to be mostly manageable.
- The outcome of the recent New York City steam main rupture is still pending.

Financial Risk: Significant

- We assess the company's financial measures using our medial volatility financial benchmarks tables compared to the typical corporate issuer, reflecting CECONY's lower-risk, rate-regulated utility business and management of regulatory risk.
- We expect the company's financial measures to modestly weaken in 2018, but to remain within the range for its current financial risk profile category.
- The company's weaker financial measures primarily reflect its elevated capital spending program, and the effects of U.S. tax reform.
- Specifically, we expect CECONY's funds from operations (FFO) to debt average to be about 16% through 2020, down from about 19% for 2017.
- CECONY remains under a multiyear electric and gas-rate plan through 2019, providing some support to the company's cash flows.

Outlook: Stable

S&P Global Ratings' stable outlook on New York-based Consolidated Edison Co. of New York Inc. (CECONY) mirrors our outlook on parent, Consolidated Edison Inc.'s (Con Edison). The stable outlook reflects our view that the vast majority of Con Edison's business mix will continue to reflect low-risk regulated utility operations despite a modest weakening of the company's business risk. In addition, the stable outlook reflects our expectation that the growth of Con Edison's renewables business will be measured and balanced with growth in the regulated operations, and that the company's FFO to debt will remain consistently above 16%.

Downside scenario

We could lower our ratings on CECONY if we lower our ratings on parent Con Edison. This could occur if Con Edison disproportionately expands the size of its nonregulated business operations, or if the company experiences adverse regulatory outcomes that impede its overall management of regulatory risk. We could also lower the ratings if the company's FFO to debt consistently weakens below 16%, either through general rate case outcomes that are lower than expected, or if it disproportionately finances a major acquisition with leverage. Furthermore, we would lower our ratings if Con Edison significantly supports its renewable energy projects, should these projects run into financial distress or experience setbacks.

Upside scenario

While unlikely, given the current financial risk profile, we could raise the ratings on CECONY if the parent Con Edison significantly improves its financial measures, including FFO to debt that consistently approaches 23%.

Our Base-Case Scenario

Assumptions

- Management of regulatory risk that is generally consistent with peers.
- Multiyear electric and gas-rate plan through 2019.
- Average customer growth.
- Capital spending of about $ 3.2 billion annually.
- Dividends averaging about $850 million.
- Negative discretionary cash flows for the next several years, reflecting the company's elevated capital spending requirements and dividend payments.

Key Metrics

	2017A	2018E	2019E
FFO/debt (%)	19.1	15-17	14-16
Debt/EBITDA (X)	4	4.1-4.3	4.5-4.7

A--Actual. E--Estimate. FFO--Funds from operations.

Company Description

Consolidated Edison Co. of New York Inc. (CECONY) provides regulated electric, gas, and steam utility services to approximately 4.5 million customers in New York City and Westchester County in New York State. The company's assets consist of mostly transmission and distribution facilities, and steam-generating facilities with total capacity of 732 megawatts. CECONY is regulated by the New York Public Service Commission (NYPSC), and is a fully owned subsidiary of parent Consolidated Edison Inc. On a forward-looking basis, we expect CECONY to contribute about 85% of Con Edison's overall EBITDA.

Business Risk: Excellent

Our assessment of CECONY's business risk profile largely reflects its low-risk, regulated electric, gas and steam utility operations, our view of its management of regulatory risk, and its large customer base.

CECONY serves as the sole provider of essential utility services to almost all of New York City and most of Westchester County in New York. The company has a large customer base, with about 3.4 million electric, 1.1 million natural gas, and 1,600 steam customers. This limits the company's susceptibility to economic cyclicality and provides for relatively stable cash flows.

We view CECONY's management of regulatory risk as consistent with peer utilities in the state. The company is currently operating under a multiyear electric and gas-rate plan through 2019. The rate plan continues the company's revenue-decoupling mechanism, and approves CECONY's $1.3 billion Automatic Meter Infrastructure (AMI) or smart meter spending plan, in part to support the NYPSC's Reforming the Energy Vision (REV) objectives of grid modernization. We view this regulatory outcome as constructive, and indicative of the CECONY's effective management of regulatory risk.

Since its inception in 2014, REV has expanded to include much broader policy goals, including a clean energy standard that mandates that 50% of New York State's electricity come from renewable energy resources, and for reducing carbon emissions by 40% by 2030.In 2017, the NYPSC issued a related REV order on net energy metering, gradually phasing in a new market-based compensation mechanism for Distributed Generation (DG). CECONY is also trying to develop smart solutions for gas customers seeking to apply REV concepts, such as expanding energy efficiency and demand response programs and developing source heating alternatives.

Overall, we expect CECONY's implementation of REV to be mostly manageable, in part due to the deployment of smart meters. However, if the pace of implementation resulted in either greater operating risk or it adversely disrupted the regulatory framework, our view of the regulatory environment in New York could change, possibly affecting our assessment of the company's business risk.

Separately, in July 2018, a CECONY steam main located in New York City ruptured, and debris from the incident included dirt and mud containing asbestos. The NYPSC is currently investigating the matter, and the outcome remains pending.

Financial Risk: Significant

We evaluate CECONY's financial risk profile using our medial volatility financial benchmarks tables compared to the typical corporate issuer, reflecting the company's lower-risk regulated business model , and management of regulatory risk. Under our base case scenario that includes capital spending of about $ 3.2 billion, multiyear electric- and gas-rate plan through 2019, dividends of about $850 million, and the effects of U.S. tax reform, we expect FFO to debt to average about 16% through 2020, down from about 19% in 2017. The company's weaker financial measures primarily reflect its elevated capital spending program, and the effects of U.S. tax reform.

Liquidity: Adequate

CECONY has adequate liquidity, in our view, and can more than cover its needs for the next 12 months even if EBITDA declines by 10%. We expect the company's liquidity sources over the next 12 months will exceed its uses by more than 1.1x. We also expect that CECONY will meet other requirements that support such a liquidity designation, including the ability to absorb high–impact, low-probability events, with limited need for refinancing. Under our stress scenario, we do not expect the company would require access to the capital markets during that period to meet its liquidity needs. CECONY also benefits from sound relationships with its banks, and a generally satisfactory standing in the credit markets.

Principal Liquidity Sources	Principal Liquidity Uses
• Revolving credit facility of about $2.25 billion; • Cash FFO of about $ 2.7 billion; and • Available cash balance of about $830 million.	• Debt maturities of about $2.3 billion including $550 million outstanding under its commercial paper program; • Annual dividends of averaging about $850 million; and • Maintenance capital spending of $1.8 billion.

Group Influence

Under our group rating methodology, we consider CECONY as a core subsidiary of parent Con Edison, reflecting our view that it is highly unlikely to be sold, is integral to the group's strategy, and has a strong long-term commitment from Con Edison's senior management. There are no significant regulatory mechanisms in place that protect CECONY from its parent and therefore, we align our issuer credit rating on CECONY with that of parent Con Edison's group credit profile.

Ratings Score Snapshot

Issuer Credit Rating

A-/Stable/A-2

Business risk: Excellent

- **Country risk:** Very low
- **Industry risk:** Very low
- **Competitive position:** Strong

Financial risk: Significant

- **Cash flow/Leverage:** Significant

Anchor: a-

Modifiers

- **Diversification/Portfolio effect:** Neutral (no impact)
- **Capital structure:** Neutral (no impact)
- **Financial policy:** Neutral (no impact)
- **Liquidity:** Adequate (no impact)
- **Management and governance:** Satisfactory (no impact)
- **Comparable rating analysis:** Neutral (no impact)

Stand-alone credit profile : a-

- **Group credit profile:** a-
- **Entity status within group:** Core (no impact)

Issue Ratings--Subordinated Risk Analysis

Capital Structure	Analytical Conclusions
CECONY's capital structure consists of about $13.5 billion of senior unsecured debt issued at CECONY, and a $950 million commercial paper program.	CECONY's senior unsecured debt is rated 'A-', the same as our issuer credit rating on the company, because we view this instrument as unsecured debt of a qualifying investment-grade regulated utility. Our rating on CECONY's commercial paper is 'A-2' based on the company's issuer credit rating.

Related Criteria

- Criteria - Corporates - General: Reflecting Subordination Risk In Corporate Issue Ratings, March 28, 2018
- General Criteria: Methodology For Linking Long-Term And Short-Term Ratings, April 7, 2017
- Criteria - Corporates - General: Methodology And Assumptions: Liquidity Descriptors For Global Corporate Issuers, Dec. 16, 2014
- General Criteria: Group Rating Methodology, Nov. 19, 2013
- Criteria - Corporates - Utilities: Key Credit Factors For The Regulated Utilities Industry, Nov. 19, 2013
- Criteria - Corporates - General: Corporate Methodology: Ratios And Adjustments, Nov. 19, 2013
- Criteria - Corporates - General: Corporate Methodology, Nov. 19, 2013
- General Criteria: Country Risk Assessment Methodology And Assumptions, Nov. 19, 2013
- General Criteria: Methodology: Industry Risk, Nov. 19, 2013
- General Criteria: Methodology: Management And Governance Credit Factors For Corporate Entities And Insurers, Nov. 13, 2012
- General Criteria: Use Of CreditWatch And Outlooks, Sept. 14, 2009

Business And Financial Risk Matrix

	Financial Risk Profile					
Business Risk Profile	Minimal	Modest	Intermediate	**Significant**	Aggressive	Highly leveraged
Excellent	aaa/aa+	aa	a+/a	**a-**	bbb	bbb-/bb+
Strong	aa/aa-	a+/a	a-/bbb+	bbb	bb+	bb
Satisfactory	a/a-	bbb+	bbb/bbb-	bbb-/bb+	bb	b+
Fair	bbb/bbb-	bbb-	bb+	bb	bb-	b
Weak	bb+	bb+	bb	bb-	b+	b/b-
Vulnerable	bb-	bb-	bb-/b+	b+	b	b-

Consolidated Edison, Inc.

Rating Type	Rating	Outlook	Last Rating Action
Long-Term IDR	BBB+	Stable	Review - No Action 20 April 2018
Short-Term IDR	F2		Review - No Action 20 April 2018
Senior Unsecured Debt	BBB+		Review - No Action 20 April 2018
CP	F2		Review - No Action 20 April 2018

Financial Summary

(USDm)	Dec 2014	Dec 2015	Dec 2016	Dec 2017
Gross Revenue	12,919	12,554	12,075	12,033
Operating EBITDAR	3,235	3,557	3,687	3,950
Cash Flow from Operations	2,831	3,277	3,459	3,366
Capital Intensity (Capex/Revenue) (%)	17.3	20.4	30.5	28.6
Total Adjusted Debt With Equity Credit	12,991	14,387	15,962	16,748
FFO Fixed-Charge Coverage (x)	6.3	5.9	5.7	5.3
FFO-Adjusted Leverage (x)	3.5	3.7	4.0	4.3
Total Adjusted Debt/Operating EBITDAR (x)	4.0	4.0	4.3	4.1

Source: Fitch Ratings, Fitch Solutions.

Consolidated Edison Inc.'s (ED) ratings reflect the ownership of two financially sound transmission and distribution (T&D) regulated utilities that are projected by Fitch Ratings to contribute the bulk of consolidated earnings and cash flows over the forecast horizon. ED's ratings are also supported by low parent-level debt, which Fitch expects the company to fully retire by 2022. An elevated capex program and a modest rise in consolidated leverage following the recent $2.12 billion acquisition of renewable assets from Sempra Energy (BBB+/Stable) lead to little headroom in consolidated credit metrics at the 'BBB+' rating level.

Key Rating Drivers

Conservative Business Model: ED's credit profile is supported by the predictable cash flows of regulated T&D utility subsidiaries Consolidated Edison Co. of New York, Inc. (CECONY; BBB+/Stable) and Orange & Rockland Utilities, Inc. (ORU; BBB+/Stable) and the financial support it receives from them through dividends for payment of corporate expenses, dividends to common shareholders and other business matters. CECONY and ORU are forecast to represent around 90% of consolidated EBITDA over 2018–2021.

Regulatory Predictability: CECONY's three-year electric and gas rate plan provides regulatory predictability through 2019. The rate plan features aggregate electric and gas base rate increases of $505 million and $177 million, respectively, over 2017–2019. CECONY's projected earnings and cash flows further benefit from the expiration of a combined $89 million of temporary bill credits that were implemented under the previous rate plan. Fitch considers the rate outcome to be balanced and in line with previous expectations. ORU has a pending rate filing before the New York Public Service Commission (NYSPSC) requesting a revised base rate increase of $30.4 million for the electric business and a rate decrease of $0.5 million for the gas business, based on a 9.75% authorized ROE and a 48% common equity ratio. The new rates are to be effective Jan. 1, 2019.

Acquisition of Sempra Solar Holdings: ED's announcement that it is acquiring Sempra Solar Holdings, a Sempra Energy (BBB+/Stable) subsidiary that owns 981MW of utility-scale solar renewable projects for a total consideration of approximately $2.12 billion, is neutral to ED's ratings, in Fitch's view. The $2.12 billion transaction price reflects the assumption of $576.0 million of existing nonrecourse project-level debt and a $1.54 billion purchase price that ED plans to fund with a $715.0 million common equity issuance and $825.0 million of long-term debt that will be nonrecourse to ED. In rating ED, Fitch treats the nonrecourse project financing as on-balance-sheet debt and reflects the leverage in the consolidated credit metrics. Fitch considers ED's non-utility renewable business to carry a relatively higher business risk profile than CECONY or ORU but a lower business risk than its commodity-sensitive midstream business. Fitch expects ED's mostly contracted midstream operations to remain a small part of the consolidated group in the near to intermediate term. The renewables acquisition is expected to be completed near the end of 2018. Assuming a 2018 closing, ED expects the transaction to be earnings accretive in 2018, dilutive in 2019 and 2020 due primarily to accounting for third-party tax equity investments and accretive thereafter.

Elevated Capex: Management expects consolidated capital investments to be approximately $12.6 billion over 2018–2020, including $8.9 billion, or 71% of total consolidated capex, at CECONY; $593 million, or 5%, at ORU; $2.7 billion, or 21%, at the clean energy businesses (CEBs) (including $1.5 billion renewables acquisition); and $400 million, or 3%, at Con Edison Transmission, Inc. (CET), ED's electric and gas transmission businesses. Utility capex is primarily earmarked toward replacement of aged infrastructure, network reliability enhancement including a sizeable advanced metering infrastructure program, and projects addressing the Reforming the Energy Vision (REV) initiative.

Pressured Credit Metrics: Fitch forecasts ED's consolidated EBITDAR and FFO leverage metrics to approximate in the mid-to-high 4.0x over the forecast period, providing little headroom at current rating levels. The negative cash flow impact of tax reform at the utilities, a modest rise in consolidated leverage due to incremental nonrecourse debt related to the renewables acquisition and elevated capex pressure credit metrics. In rating ED, Fitch treats the nonrecourse project financing as on-balance-sheet debt and reflects the leverage in the consolidated credit metrics. There is no incremental parent-level debt associated with the transaction and Fitch expects ED to fully retire existing parent debt by 2022.

Parent-Subsidiary Linkage: There is a strong rating linkage among ED and its two regulated utility subsidiaries. A downgrade of CECONY, given strong financial ties, with the utility generally contributing over 90% of ED's consolidated cash flows, would likely result in a downgrade of ED. A downgrade of ED would likely result in a downgrade of ORU, given the utility's small size within the corporate structure. Given the linkages, Fitch would allow a maximum of one-notch differential between the Long-Term Issuer Default Ratings (IDRs) of ED and each of its two regulated utilities.

Fitch applies a bottom-up approach in rating ED's utility subsidiaries and a consolidated approach in rating ED. Fitch considers CECONY and ORU to be stronger entities than ED due to the utilities' low business risk nature of their regulated operations and relatively stronger financial profiles.

Rating Derivation Relative to Peers

Rating Derivation Versus Peers	
Peer Comparison	ED's credit profile as a utility parent holding company is well positioned at the 'BBB+' rating category and is relatively in line with peers Eversource Energy (BBB+/Positive) and AVANGRID (BBB+/Stable). Eversource and AVANGRID's multi-state utility operations provide more regulatory diversification compared with ED, whose utility subsidiaries operate in New York and New Jersey only. ED has a slightly weaker business risk profile than Eversource, whose operations consist solely of regulated businesses, and a comparable to moderately stronger business risk profile than AVANGRID, which carries a greater proportion of unregulated businesses in its earnings mix relative to ED. ED's financial profile is comparable to the one of Eversource but weaker than the one of AVANGRID. Fitch projects EBITDAR leverage metric to average in the low 4.0x through 2020 for both ED and Eversource, while AVANGRID's adjusted debt/EBITDAR is projected to average 2.8x–3.2x.

Parent/Subsidiary Linkage	There is a strong rating linkage among ED and its two regulated utility subsidiaries. A downgrade of CECONY, given strong financial ties, with the utility generally contributing over 90% of ED's consolidated cash flows, would likely result in a downgrade of ED. A downgrade of ED would likely result in a downgrade of ORU, given the utility's small size within the corporate structure. Given the linkages, Fitch would allow a maximum of one-notch differential between the Long-Term IDRs of ED and each of its two regulated utilities.
Country Ceiling	No Country Ceiling constraint was in effect for these ratings.
Operating Environment	No operating environment influence was in effect for these ratings.
Other Factors	Not applicable.

Source: Fitch Ratings.

Navigator Peer Comparison

Issuer		Business profile						Financial profile		
Name	IDR/Outlook	Operating Environment	Management and Corporate Governance	Regulation	Market and Franchise	Asset Base and Operations	Commodity Exposure	Profitability	Financial Structure	Financial Flexibility
Consolidated Edison, Inc. (Con Ed)	BBB+/Sta	aa	a	bbb+	bbb+	bbb	a	bbb+	bbb+	bbb+
Eversource Energy	BBB+/Pos	aa	a	bbb+	bbb+	a-	a	bbb+	bbb+	a-
AVANGRID, Inc.	BBB+/Sta	aa	bbb	bbb	bbb+	bbb+	a	bbb+	a-	a-

Source: Fitch

Importance Higher Moderate Lower

Rating Sensitivities

Future Developments That May, Individually or Collectively, Lead to Positive Rating Action

- Given limited headroom in credit metrics for the current rating category, no positive rating actions are anticipated in the near term.

Future Developments That May, Individually or Collectively, Lead to Negative Rating Action

- Given strong financial ties, a downgrade at CECONY;
- FFO-adjusted leverage greater than 5.0x and adjusted debt/EBITDAR greater than 4.5x on a sustained basis;
- A more aggressive management strategy toward the unregulated businesses, including investments into more volume/commodity-price sensitive midstream operations, that leads to incremental parent-level debt.

Liquidity and Debt Structure

Adequate Liquidity: Group liquidity is supported by a $2.25 billion shared bank credit facility that expires in December 2022. The full amount of the facility is available to CECONY, while ED has access to a total of $1 billion and ORU, a total of $200 million. There was approximately $2.25 billion of available consolidated liquidity as of June 30, 2018, including $1.38 billion of unused facilities and $866 million of cash and cash equivalents. The bank credit facility has a financial covenant that requires total consolidated debt/total capital be no greater than 65%. All entities were in compliance as of June 30, 2018. Consolidated long-term debt maturities are considered manageable, with $650 million due in 2018, $535 million due in 2019 and $750 million due in 2020. The long-term debt maturities exclude the amortization of project-level debt at ED's non-regulated subsidiary Consolidated Edison Development Inc.

Debt Maturities and Liquidity

Liquidity Summary (Consolidated)	Original	Original
	12/31/2017	6/30/2018
(USD Mil.)		
Total Cash & Cash Equivalents	844	921
Short-Term Investments	0	0
Less: Not Readily Available Cash and Cash Equivalents	47	55
Fitch-defined Readily Available Cash and Cash Equivalents	797	866
Availability under Committed Lines of Credit	1,673	1,381
Total Liquidity	2,470	2,247
LTM EBITDA	4,057	4,087
LTM FCF	-880	-1,497

Source: Fitch Ratings, Fitch Solutions, Consolidated Edison, Inc.

Scheduled Long-Term Debt Maturities (Consolidated)	Original
(USD Mil.)	06/30/2018
Current Year	650
Plus 1 Year	535
Plus 2 Years	750
Plus 3 Years	1,140
Plus 4 Years	293
Thereafter	13,672
Total Debt Maturities	17,040

Source: Fitch Ratings, Fitch Solutions, Consolidated Edison, Inc.

Key Rating Issues

Acquisition of Sempra Solar Holdings: ED announced on Sept. 20, 2018 it had entered into an agreement to acquire through its wholly owned subsidiary, Consolidated Edison Development, Inc. (CED; not rated), Sempra Solar Holdings, a Sempra Energy subsidiary that owns 981MW of renewable projects for a total consideration of approximately $2.12 billion. The $2.12 billion transaction price reflects the assumption of $576.0 million of existing nonrecourse project-level debt and a $1.54 billion purchase price that ED plans to fund with a $715.0 million common equity issuance and $825.0 million of long-term debt that will be nonrecourse to ED. Fitch considers ED's non-utility renewable business to carry a relatively higher business risk profile than its regulated utilities but a lower business risk than its commodity-sensitive midstream business. The acquired portfolio generates relatively stable and predictable cash flows, with an average contract life of 19 years with counterparties that carry a weighted average 'BBB' credit rating. In addition, Fitch expects ED's mostly contracted midstream operations to remain a small part of the consolidated group in the near to intermediate term.

Fitch expects CECONY and ORU to continue to represent the majority of ED's consolidated earnings and cash flows over the forecast period, contributing nearly 90%. There is no incremental parent-level debt or parent guarantees for new debt associated with the transaction, and Fitch expects ED to fully retire its existing parent-level debt by 2022. In rating ED, Fitch treats the nonrecourse project financing as on-balance-sheet debt and reflects the leverage in the consolidated credit metrics. Including the transaction, Fitch forecasts ED's leverage measures to approximate in the mid-to-high 4.0x, which provides little headroom at current rating levels.

The acquired renewable assets are a good strategic fit to ED, aligning well with the existing utility-scale renewable portfolio of approximately 1.6GW. The acquisition will increase ED's portfolio to approximately 2.6GW, of which 85% is solar and 15% wind. CED and Sempra Solar Holdings jointly own 379MW of the projects, while the remaining 602MW are 100% owned by the Sempra subsidiary and mostly adjacent to CED's existing operating projects, located primarily in the West Coast. Fitch expects ED to further expand its renewable business in the future, driven by supportive state policies and attractive returns generated by those investments. Along with the 981MW of renewable projects, the acquisition provides certain development rights for additional solar electric production and energy storage projects. Fitch believes the clarity on federal renewable tax subsidies, aggressive state renewable policy standards, customer demand for cleaner generation, and improving economics will continue to drive solar generation in the U.S. and bodes well for the renewable business.

The transaction is subject to approval by the Federal Energy Regulatory Commission, the U.S. Department of Energy, and the expiration or early termination of the waiting period under the Hart-Scott-Rodino Act. The acquisition is expected to be completed near the end of 2018. Assuming a 2018 closing, ED expects the transaction to be earnings accretive in 2018, dilutive in 2019 and 2020 due primarily to accounting for third-party tax equity investments and accretive thereafter. Pro forma for the transaction, Con Edison Clean Energy Businesses, Inc., CED's direct parent company, estimates it will generate 2019 adjusted EBITDA of approximately $485 million.

Key Assumptions

Fitch's Key Assumptions Within Our Rating Case for the Issuer Include:

- Base rate increases at the utilities as per the existing rate plans;
- Balanced outcome in ORU's pending rate case;
- Consolidated capex as per management projections;
- Sempra Solar acquisition closing in 2018;
- Utilities continue to contribute near 90% of consolidated cash flows.

Financial Data

(USDm)	Historical			
	Dec 2014	Dec 2015	Dec 2016	Dec 2017
Summary Income Statement				
Gross Revenue	12,919	12,554	12,075	12,033
Revenue Growth (%)	4.6	-2.8	-3.8	-0.3
Operating EBITDA (Before Income from Associates)	3,235	3,557	3,687	3,950
Operating EBITDA Margin (%)	25.0	28.3	30.5	32.8
Operating EBITDAR	3,235	3,557	3,687	3,950
Operating EBITDAR Margin (%)	25.0	28.3	30.5	32.8
Operating EBIT	2,164	2,427	2,471	2,609
Operating EBIT Margin (%)	16.8	19.3	20.5	21.7
Gross Interest Expense	-592	-656	-702	-737
Pretax Income (Including Associate Income/Loss)	1,660	1,798	1,943	1,997
Summary Balance Sheet				
Readily Available Cash and Equivalents	699	944	776	797
Total Debt with Equity Credit	12,991	14,387	15,962	16,748
Total Adjusted Debt with Equity Credit	12,991	14,387	15,962	16,748
Net Debt	12,292	13,443	15,186	15,951
Summary Cash Flow Statement				
Operating EBITDA	3,235	3,557	3,687	3,950
Cash Interest Paid	-592	-656	-702	-737
Cash Tax	-633	-163	-180	29
Dividends Received Less Dividends Paid to Minorities (Inflow/(Out)flow)	0	0	68	107
Other Items Before FFO	1,131	489	436	-66
Funds Flow from Operations	3,141	3,227	3,309	3,283
FFO Margin (%)	24.3	25.7	27.4	27.3
Change in Working Capital	-310	50	150	83
Cash Flow from Operations (Fitch Defined)	2,831	3,277	3,459	3,366
Total Non-Operating/Nonrecurring Cash Flow	0	0	0	0
Capex	-2,239	-2,562	-3,680	-3,443
Capital Intensity (Capex/Revenue) %	17.3	20.4	30.5	28.6
Common Dividends	-739	-733	-763	-803
FCF	-147	-18	-984	-880
Net Acquisitions and Divestitures	-175	-299	252	34
Other Investing and Financing Cash Flow Items	-362	-815	-1,569	-313
Net Debt Proceeds	719	1,376	1,380	786
Net Equity Proceeds	-10	1	753	394
Total Change in Cash	25	245	-168	21
Calculations for Forecast Publication				
Capex, Dividends, Acquisitions and Other Items Before FCF	-3,153	-3,594	-4,191	-4,212
FCF After Acquisitions and Divestitures	-322	-317	-732	-846
FCF Margin (After Net Acquisitions) (%)	-2.5	-2.5	-6.1	-7.0
Coverage Ratios				
FFO Interest Coverage (x)	6.3	5.9	5.7	5.3
FFO Fixed-Charge Coverage (x)	6.3	5.9	5.7	5.3
Operating EBITDAR/Interest Paid + Rents (x)	5.5	5.4	5.3	5.5
Operating EBITDA/Interest Paid (x)	5.5	5.4	5.3	5.5
Leverage Ratios				
Total Adjusted Debt/Operating EBITDAR (x)	4.0	4.0	4.3	4.1
Total Adjusted Net Debt/Operating EBITDAR (x)	3.8	3.8	4.0	3.9
Total Debt with Equity Credit/Operating EBITDA (x)	4.0	4.0	4.3	4.1
FFO-Adjusted Leverage (x)	3.5	3.7	4.0	4.3
FFO-Adjusted Net Leverage (x)	3.3	3.5	3.8	4.0

Source: Fitch Ratings, Fitch Solutions.

How to Interpret the Forecast Presented

The forecast presented is based on the agency's internally produced, conservative rating case forecast. It does not represent the forecast of the rated issuer. The forecast set out above is only one component used by Fitch to assign a rating or determine a rating outlook, and the information in the forecast reflects material but not exhaustive elements of Fitch's rating assumptions for the issuer's financial performance. As such, it cannot be used to establish a rating, and it should not be relied on for that purpose. Fitch's forecasts are constructed using a proprietary internal forecasting tool, which employs Fitch's own assumptions on operating and financial performance that may not reflect the assumptions that you would make. Fitch's own definitions of financial terms such as EBITDA, debt or free cash flow may differ from your own such definitions. Fitch may be granted access, from time to time, to confidential information on certain elements of the issuer's forward planning. Certain elements of such information may be omitted from this forecast, even where they are included in Fitch's own internal deliberations, where Fitch, at its sole discretion, considers the data may be potentially sensitive in a commercial, legal or regulatory context. The forecast (as with the entirety of this report) is produced strictly subject to the disclaimers set out at the end of this report. Fitch may update the forecast in future reports but assumes no responsibility to do so.

Rating Navigator

Consolidated Edison, Inc. (Con Ed)

Corporates Ratings Navigator
US Utilities

FitchRatings

Consolidated Edison, Inc. (Con Ed)

Corporates Ratings Navigator
US Utilities

Operating Environment

aa+	Economic Environment	aa	Very strong combination of countries where economic value is created and where assets are located.
aa	Financial Access	aa	Very strong combination of issuer specific funding characteristics and of the strength of the relevant local financial market.
	Systemic Governance	aa	Systemic governance (eg rule of law, corruption; government effectiveness) of the issuer's country of incorporation consistent with 'aa'.
b-			
ccc			

Management and Corporate Governance

aa-	Management Strategy	a	Coherent strategy and good track record in implementation.
a+	Governance Structure	aa	No record of governance failing. Experienced board exercising effective check and balance to management. No ownership concentration.
a	Group Structure	a	Group structure shows some complexity but mitigated by transparent reporting.
a-	Financial Transparency	a	High quality and timely financial reporting.
bbb+			

Regulation

a	Degree of Transparency and Predictability	bbb	Generally transparent and predictable regulation with limited political interference.
a-	Timeliness of Cost Recovery	a	Minimal lag to recover capital and operating costs.
bbb+	Trend in Authorized ROEs	bb	Significantly below-average authorized ROE.
bbb	Mechanisms Available to Stabilize Cash Flows	a	Revenues fully insulated from variability in consumption.
bbb-	Mechanisms Supportive of Creditworthiness	bbb	Effective regulatory ring-fencing or minimum creditworthiness requirements.

Market and Franchise

a	Market Structure	a	Well-established market structure with complete transparency in price-setting mechanisms.
a-	Consumption Growth Trend	bbb	Customer and usage growth in line with industry averages.
bbb+	Customer Mix	a	Favorable customer mix.
bbb	Geographic Location	bbb	Beneficial location or reasonable locational diversity.
bbb-	Supply Demand Dynamics	bbb	Moderately favorable outlook for prices/rates.

Asset Base and Operations

a-	Diversity of Assets	bbb	Good quality and/or reasonable scale diversified assets.
bbb+	Operations Reliability and Cost Competitiveness	bbb	Reliability and cost of operations at par with industry averages.
bbb	Exposure to Environmental Regulations	bbb	Limited or manageable exposure to environmental regulations.
bbb-	Capital and Technological Intensity of Capex	bbb	Moderate reinvestments requirements in established technologies.
bb+			

Commodity Exposure

aa-	Ability to Pass Through Changes in Fuel	a	Complete pass-through of commodity costs.
a+	Underlying Supply Mix	a	Extremely low cost and flexible supply.
a	Hedging Strategy	a	Highly captive supply and customer base.
a-			
bbb+			

Profitability

a	Free Cash Flow	bbb	Structurally neutral to negative FCF across the investment cycle.
a-	Volatility of Profitability	a	Higher stability and predictability of profits relative to utility peers.
bbb+			
bbb			
bbb-			

Financial Structure

a	Lease Adjusted FFO Gross Leverage	a	3.5x
a-	Total Adjusted Debt/Operating	bbb	3.75x
bbb+			
bbb			
bbb-			

Financial Flexibility

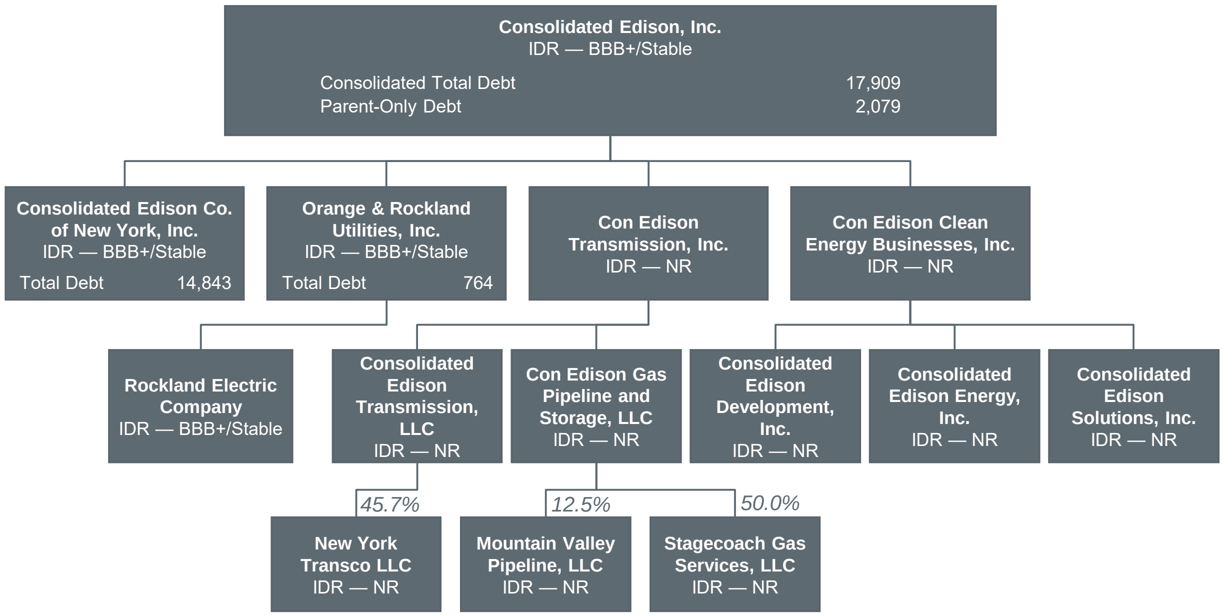
a	Financial Discipline	a	Clear commitment to maintain a conservative policy with only modest deviations allowed.
a-	Liquidity	a	Very comfortable liquidity. Well-spread maturity schedule of debt. Diversified sources of funding.
bbb+	FFO Fixed Charge Cover	bbb	4.5x
bbb			
bbb-			

How to Read This Page: The left column shows the three-notch band assessment for the overall Factor, illustrated by a bar. The right column breaks down the Factor into Sub-Factors, with a description appropriate for each Sub-Factor and its corresponding category.

Navigator Version: RN 1.42.2.0

Simplified Group Structure Diagram

Pro Forma Organizational Debt Structure — Consolidated Edison, Inc.
($ Mil., As of June 30, 2018)



IDR – Issuer Default Rating. NR – Not rated.
Source: Fitch Ratings, Fitch Solutions, Consolidated Edison, Inc.

Peer Financial Summary

Company	IDR	Financial Statement Date	Gross Revenue ($ Mil.)	Funds Flow From Operations ($ Mil.)	FFO Fixed Charge Coverage (x)	FFO Adjusted Leverage (x)	Total Adjusted Debt/Operating EBITDAR (x)
Consolidated Edison, Inc. (Con Ed)	BBB+						
	BBB+	2017	12,033	3,283	5.3	4.3	4.1
	BBB+	2016	12,075	3,309	5.7	4.0	4.3
	BBB+	2015	12,554	3,227	5.9	3.7	4.0
Eversource Energy	BBB+						
	BBB+	2017	7,752	1,927	5.3	5.7	5.0
	BBB+	2016	7,639	2,071	5.8	4.4	4.2
	BBB+	2015	7,955	1,737	5.4	4.8	4.2
AVANGRID, Inc.	BBB+						
	BBB+	2017	5,963	1,724	5.5	3.2	3.5
	BBB+	2016	6,018	1,573	5.4	2.9	2.7
	BBB	2015	4,367	1,109	4.4	3.7	4.2

Source: Fitch Ratings, Fitch Solutions.

Reconciliation of Key Financial Metrics

(USD Millions, As reported)	31 Dec 2017
Income Statement Summary	
Operating EBITDA	3,950
+ Recurring Dividends Paid to Non-controlling Interest	(1)
+ Recurring Dividends Received from Associates	108
+ Additional Analyst Adjustment for Recurring I/S Minorities and Associates	0
= Operating EBITDA After Associates and Minorities (k)	**4,057**
+ Operating Lease Expense Treated as Capitalised (h)	**0**
= Operating EBITDAR after Associates and Minorities (j)	**4,057**
Debt & Cash Summary	
Total Debt with Equity Credit (l)	**16,748**
+ Lease-Equivalent Debt	0
+ Other Off-Balance-Sheet Debt	0
= Total Adjusted Debt with Equity Credit (a)	**16,748**
Readily Available Cash [Fitch-Defined]	797
+ Readily Available Marketable Securities [Fitch-Defined]	0
= Readily Available Cash & Equivalents (o)	**797**
Total Adjusted Net Debt (b)	**15,951**
Cash-Flow Summary	
Preferred Dividends (Paid) (f)	**0**
Interest Received	79
+ Interest (Paid) (d)	**(737)**
= Net Finance Charge (e)	**(658)**
Funds From Operations [FFO] (c)	**3,283**
+ Change in Working Capital [Fitch-Defined]	83
= Cash Flow from Operations [CFO] (n)	**3,366**
Capital Expenditures (m)	**(3,443)**
Multiple applied to Capitalised Leases	**8.0**
Gross Leverage	
Total Adjusted Debt / Op. EBITDAR* [x] (a/j)	**4.1**
FFO Adjusted Gross Leverage [x] (a/(c-e+h-f))	**4.2**
Total Adjusted Debt/(FFO - Net Finance Charge + Capitalised Leases - Pref. Div. Paid)	
Total Debt With Equity Credit / Op. EBITDA* [x] (l/k)	**4.1**
Net Leverage	
Total Adjusted Net Debt / Op. EBITDAR* [x] (b/j)	**3.9**
FFO Adjusted Net Leverage [x] (b/(c-e+h-f))	**4.0**
Total Adjusted Net Debt/(FFO - Net Finance Charge + Capitalised Leases - Pref. Div. Paid)	
Total Net Debt / (CFO - Capex) [x] ((l-o)/(n+m))	**-207.2**
Coverage	
Op. EBITDAR / (Interest Paid + Lease Expense)* [x] (j/-d+h)	**5.5**
Op. EBITDA / Interest Paid* [x] (k/(-d))	**5.5**
FFO Fixed Charge Cover [x] ((c+e+h-f)/(-d+h-f))	**5.3**
(FFO + Net Finance Charge + Capit. Leases - Pref. Div Paid) / (Gross Int. Paid + Capit. Leases - Pref. Div. Paid)	
FFO Gross Interest Coverage [x] ((c+e-f)/(-d-f))	**5.3**
(FFO + Net Finance Charge - Pref. Div Paid) / (Gross Int. Paid - Pref. Div. Paid)	

* EBITDA/R after Dividends to Associates and Minorities

Source: Fitch, based on information from company reports.

Fitch Adjustment Reconciliation

	Reported Values 31 Dec 17	Sum of Fitch Adjustments	Preferred Dividends, Associates and Minorities Cash Adjustments	Fair Value and Other Debt Adjustments	Other Adjustment	Adjusted Values
Income Statement Summary						
Revenue	12,033	0				12,033
Operating EBITDAR	3,950	0				3,950
Operating EBITDAR after Associates and Minorities	3,950	107	107			4,057
Operating Lease Expense	0	0				0
Operating EBITDA	3,950	0				3,950
Operating EBITDA after Associates and Minorities	3,950	107	107			4,057
Operating EBIT	2,609	0				2,609
Debt & Cash Summary						
Total Debt With Equity Credit	16,606	142		142		16,748
Total Adjusted Debt With Equity Credit	16,606	142		142		16,748
Lease-Equivalent Debt	0	0				0
Other Off-Balance Sheet Debt	0	0				0
Readily Available Cash & Equivalents	797	0				797
Not Readily Available Cash & Equivalents	47	0				47
Cash-Flow Summary						
Preferred Dividends (Paid)	0	0				0
Interest Received	79	0				79
Interest (Paid)	(725)	(12)			(12)	(737)
Funds From Operations [FFO]	3,176	107	107			3,283
Change in Working Capital [Fitch-Defined]	83	0				83
Cash Flow from Operations [CFO]	3,259	107	107			3,366
Non-Operating/Non-Recurring Cash Flow	0	0				0
Capital (Expenditures)	(3,443)	0				(3,443)
Common Dividends (Paid)	(803)	0				(803)
Free Cash Flow [FCF]	(987)	107	107			(880)
Gross Leverage						
Total Adjusted Debt / Op. EBITDAR* [x]	4.2					4.1
FFO Adjusted Leverage [x]	4.3					4.2
Total Debt With Equity Credit / Op. EBITDA* [x]	4.2					4.1
Net Leverage						
Total Adjusted Net Debt / Op. EBITDAR* [x]	4.0					3.9
FFO Adjusted Net Leverage [x]	4.1					4.0
Total Net Debt / (CFO - Capex) [x]	-85.9					-207.2
Coverage						
Op. EBITDAR / (Interest Paid + Lease Expense)* [x]	5.4					5.5
Op. EBITDA / Interest Paid* [x]	5.4					5.5
FFO Fixed Charge Coverage [x]	5.3					5.3
FFO Interest Coverage [x]	5.3					5.3

*EBITDA/R after Dividends to Associates and Minorities
Source: Fitch, based on information from company reports.

Related Research & Criteria

Parent and Subsidiary Rating Linkage (July 2018)
Consolidated Edison Co. of New York, Inc. (Subsidiary of Consolidated Edison, Inc.) (March 2018)
Corporate Rating Criteria (March 2018)
Corporates Notching and Recovery Ratings Criteria (March 2018)
Orange & Rockland Utilities, Inc. (And Rockland Energy Company) (March 2018)

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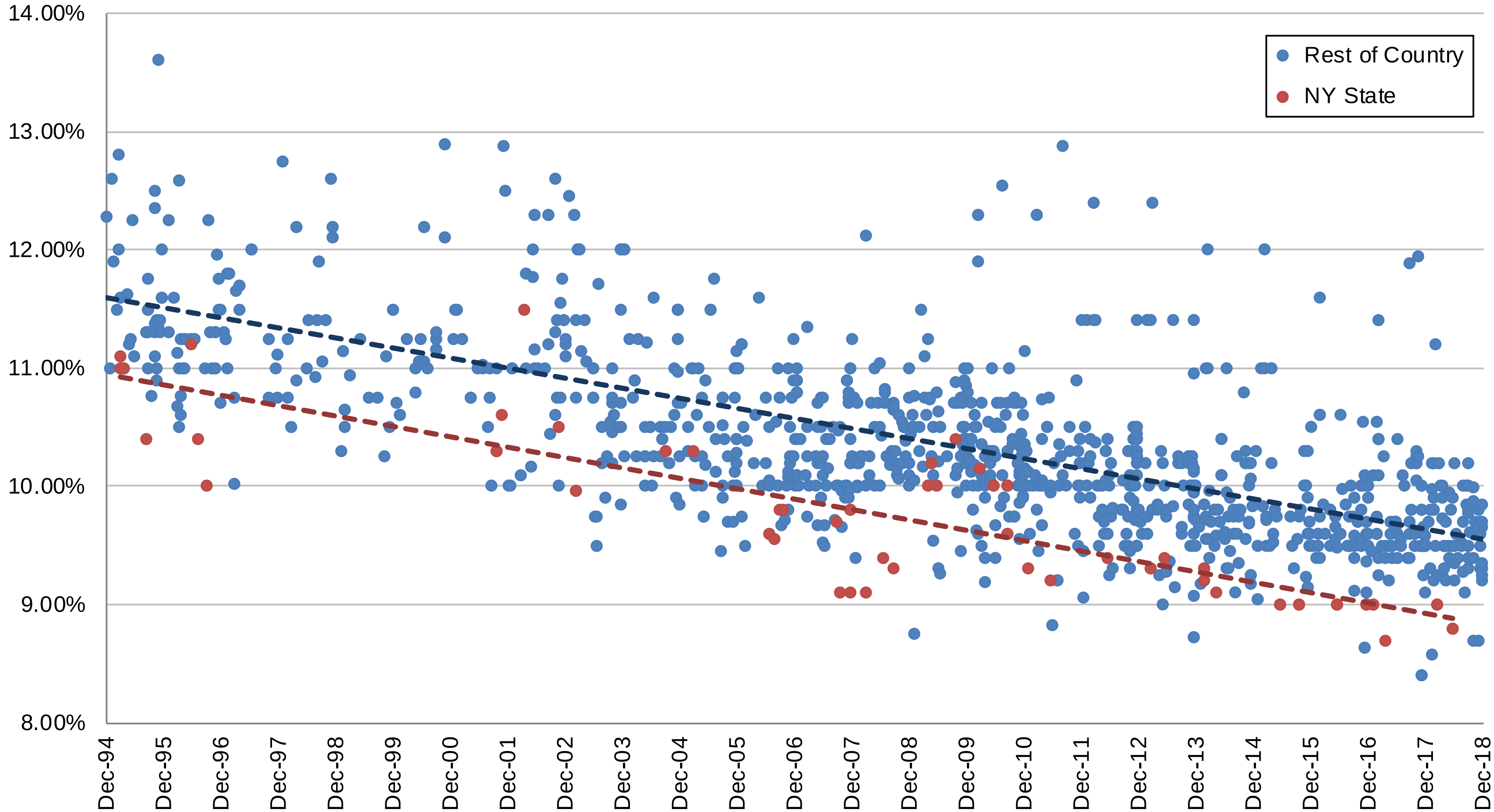
The ratings above were solicited and assigned or maintained at the request of the rated entity/issuer or a related third party. Any exceptions follow below.

Allowed Return on Equity
New York State vs. Rest of Country



Source: SNL Financial

EXHIBIT___(YS-18)
PAGE 1 of 1

SNL Financial Report
Adjustment Clauses – A State-by-State Overview

	TYPE OF ADJUSTMENT						
			Decoupling[1]			Test Year	
	Electric Fuel / Gas Commodity / Purchased Power	Energy Conser.	Full	Partial	New Capital Invest.	Forecasted	Adj. Historical
Percentage of Jurisdictions with Adjustment Clause	100%	70%	42%	38%	79%	36%	57%
Allowed by New York PSC	Yes	No	Yes		Yes[2]	Yes	

Source: SNL Financial report, "Adjustment Clauses – A State-by-State Overview" (September 12, 2017).
(1) Jurisdictions which allow some utilities full and others partial decoupling are counted as having full decoupling.
(2) Gas utilities may implement riders to recover carrying costs on incremental capex and O&M expenses associated with the replacement of leak prone pipe above targeted miles established in rates.

5-Year Average
Return on Equity
For S&P 500 Constituents

Rank	Percentile	Company	5-Year Average Return on Equity
1	100%	BOEING CO/THE	319.2%
2	100%	UNITED PARCEL SERVICE-CL B	301.0%
3	99%	CLOROX COMPANY	287.5%
4	99%	S&P GLOBAL INC	224.3%
5	99%	ABBVIE INC	171.7%
6	99%	HOME DEPOT INC	126.7%
7	98%	ALTRIA GROUP INC	115.9%
8	98%	INTL BUSINESS MACHINES CORP	91.4%
9	98%	HERSHEY CO/THE	84.9%
10	98%	DISH NETWORK CORP-A	74.7%
11	98%	SHERWIN-WILLIAMS CO/THE	72.4%
12	97%	GILEAD SCIENCES INC	71.9%
13	97%	KLA-TENCOR CORP	69.9%
14	97%	ZOETIS INC	67.3%
15	97%	MASTERCARD INC - A	63.2%
16	96%	VERIZON COMMUNICATIONS INC	62.8%
17	96%	METTLER-TOLEDO INTERNATIONAL	61.0%
18	96%	STARBUCKS CORP	60.2%
19	96%	VERISK ANALYTICS INC	59.4%
20	95%	CAMPBELL SOUP CO	59.2%
21	95%	CBOE GLOBAL MARKETS INC	59.0%
22	95%	ONEOK INC	56.1%
23	95%	SEAGATE TECHNOLOGY	55.5%
24	95%	O'REILLY AUTOMOTIVE INC	54.4%
25	94%	TJX COMPANIES INC	52.7%
26	94%	UNITED CONTINENTAL HOLDINGS	52.0%
27	94%	APTIV PLC	51.8%
28	94%	LYONDELLBASELL INDU-CL A	50.4%
29	93%	ACCENTURE PLC-CL A	49.3%
30	93%	SEALED AIR CORP	49.1%
31	93%	INTUIT INC	47.0%
32	93%	CELGENE CORP	44.9%
33	93%	NORDSTROM INC	44.5%
34	92%	AMERISOURCEBERGEN CORP	43.6%
35	92%	ROSS STORES INC	43.5%
36	92%	BROWN-FORMAN CORP-CLASS B	42.6%
37	92%	CAPRI HOLDINGS	41.8%
38	91%	ALLIANCE DATA SYSTEMS CORP	41.3%
39	91%	VIACOM INC-CLASS B	41.1%
40	91%	C.H. ROBINSON WORLDWIDE INC	40.8%

Source: Bloomberg and CEI 2017 Form 10-K.

5-Year Average
Return on Equity
For S&P 500 Constituents

Rank	Percentile	Company	5-Year Average Return on Equity
41	91%	PAYCHEX INC	40.7%
42	90%	OMNICOM GROUP	40.5%
43	90%	APPLE INC	40.5%
44	90%	3M CO	38.2%
45	90%	ROCKWELL AUTOMATION INC	37.7%
46	90%	MSCI INC	36.7%
47	89%	LOWE'S COS INC	36.2%
48	89%	GAP INC/THE	35.8%
49	89%	SYSCO CORP	35.6%
50	89%	UNITED RENTALS INC	35.6%
51	88%	SIMON PROPERTY GROUP INC	35.1%
52	88%	BALL CORP	34.2%
53	88%	ESTEE LAUDER COMPANIES-CL A	33.9%
54	88%	AUTOMATIC DATA PROCESSING	33.3%
55	88%	FORD MOTOR CO	33.1%
56	87%	BOOKING HOLDINGS INC	32.9%
57	87%	ILLINOIS TOOL WORKS	32.9%
58	87%	BROADRIDGE FINANCIAL SOLUTIONS	32.8%
59	87%	COCA-COLA CO/THE	32.8%
60	86%	HUNT (JB) TRANSPRT SVCS INC	32.5%
61	86%	BIOGEN INC	32.3%
62	86%	CBS CORP-CLASS B NON VOTING	32.2%
63	86%	ROBERT HALF INTL INC	31.9%
64	85%	PACKAGING CORP OF AMERICA	31.7%
65	85%	CELANESE CORP	31.3%
66	85%	TEXAS INSTRUMENTS INC	31.3%
67	85%	GENERAL MILLS INC	31.2%
68	85%	HARLEY-DAVIDSON INC	31.0%
69	84%	APPLIED MATERIALS INC	31.0%
70	84%	ROLLINS INC	30.8%
71	84%	WW GRAINGER INC	30.7%
72	84%	NIKE INC -CL B	30.5%
73	83%	F5 NETWORKS INC	30.2%
74	83%	KROGER CO	30.0%
75	83%	NORTHROP GRUMMAN CORP	29.9%
76	83%	ARISTA NETWORKS INC	29.6%
77	83%	HASBRO INC	29.5%
78	82%	MICRON TECHNOLOGY INC	29.5%
79	82%	ALASKA AIR GROUP INC	29.3%
80	82%	KEYSIGHT TECHNOLOGIES INC	28.8%

Source: Bloomberg and CEI 2017 Form 10-K.

5-Year Average
Return on Equity
For S&P 500 Constituents

Rank	Percentile	Company	5-Year Average Return on Equity
81	82%	HONEYWELL INTERNATIONAL INC	28.8%
82	81%	DOLLAR TREE INC	28.3%
83	81%	HUNTINGTON INGALLS INDUSTRIE	28.0%
84	81%	COPART INC	28.0%
85	81%	MONSTER BEVERAGE CORP	27.8%
86	80%	INTL FLAVORS & FRAGRANCES	27.8%
87	80%	FISERV INC	27.7%
88	80%	MICROSOFT CORP	27.4%
89	80%	PPG INDUSTRIES INC	27.3%
90	80%	DEERE & CO	27.2%
91	79%	FASTENAL CO	27.2%
92	79%	VISA INC-CLASS A SHARES	27.0%
93	79%	LEGGETT & PLATT INC	26.9%
94	79%	EASTMAN CHEMICAL CO	26.4%
95	78%	AMGEN INC	26.3%
96	78%	AMERICAN EXPRESS CO	26.3%
97	78%	SKYWORKS SOLUTIONS INC	26.3%
98	78%	BROADCOM LTD	26.0%
99	78%	COTY INC-CL A	25.9%
100	77%	BRISTOL-MYERS SQUIBB CO	25.9%
101	77%	ULTA BEAUTY INC	25.8%
102	77%	WATERS CORP	25.3%
103	77%	AMPHENOL CORP-CL A	25.2%
104	76%	HARRIS CORP	25.0%
105	76%	TAPESTRY INC	24.9%
106	76%	INTERNATIONAL PAPER CO	24.6%
107	76%	MARSH & MCLENNAN COS	24.5%
108	76%	T ROWE PRICE GROUP INC	24.4%
109	75%	GENERAL DYNAMICS CORP	24.0%
110	75%	MCKESSON CORP	23.8%
111	75%	BEST BUY CO INC	23.7%
112	75%	EDWARDS LIFESCIENCES CORP	23.6%
113	74%	ILLUMINA INC	23.6%
114	74%	NVIDIA CORP	23.6%
115	74%	JOHNSON & JOHNSON	23.6%
116	74%	ELI LILLY & CO	23.4%
117	73%	SOUTHWEST AIRLINES CO	23.3%
118	73%	REGENERON PHARMACEUTICALS	23.2%
119	73%	GLOBAL PAYMENTS INC	23.0%
120	73%	LAM RESEARCH CORP	23.0%

Source: Bloomberg and CEI 2017 Form 10-K.

5-Year Average
Return on Equity
For S&P 500 Constituents

Rank	Percentile	Company	5-Year Average Return on Equity
121	73%	XILINX INC	22.9%
122	72%	SYNCHRONY FINANCIAL	22.8%
123	72%	INTERPUBLIC GROUP OF COS INC	22.8%
124	72%	AMERIPRISE FINANCIAL INC	22.6%
125	72%	MYLAN NV	22.5%
126	71%	MACY'S INC	22.4%
127	71%	NEWELL BRANDS INC	22.2%
128	71%	EMERSON ELECTRIC CO	22.1%
129	71%	JACK HENRY & ASSOCIATES INC	22.1%
130	71%	GENERAL MOTORS CO	22.1%
131	70%	DISCOVER FINANCIAL SERVICES	22.0%
132	70%	EXPEDITORS INTL WASH INC	21.9%
133	70%	ALIGN TECHNOLOGY INC	21.9%
134	70%	BECTON DICKINSON AND CO	21.9%
135	69%	VARIAN MEDICAL SYSTEMS INC	21.8%
136	69%	UNION PACIFIC CORP	21.8%
137	69%	CATERPILLAR INC	21.7%
138	69%	FOOT LOCKER INC	21.7%
139	68%	CUMMINS INC	21.7%
140	68%	RESMED INC	21.7%
141	68%	CARDINAL HEALTH INC	21.7%
142	68%	COSTCO WHOLESALE CORP	21.7%
143	68%	TWENTY-FIRST CENTURY FOX - B	21.6%
144	67%	TWENTY-FIRST CENTURY FOX-A	21.6%
145	67%	CINTAS CORP	21.6%
146	67%	MAXIM INTEGRATED PRODUCTS INC	21.6%
147	67%	WHIRLPOOL CORP	21.5%
148	66%	ORACLE CORP	21.3%
149	66%	CBRE GROUP INC - A	21.3%
150	66%	WASTE MANAGEMENT INC	21.2%
151	66%	GENUINE PARTS CO	21.2%
152	66%	DOLLAR GENERAL CORP	21.1%
153	65%	CHURCH & DWIGHT CO INC	21.0%
154	65%	TARGET CORP	20.8%
155	65%	BORGWARNER INC	20.8%
156	65%	RAYTHEON COMPANY	20.6%
157	64%	COGNIZANT TECH SOLUTIONS-A	20.6%
158	64%	STRYKER CORP	20.6%
159	64%	PACCAR INC	20.5%
160	64%	WALT DISNEY CO/THE	20.5%

Source: Bloomberg and CEI 2017 Form 10-K.

5-Year Average
Return on Equity
For S&P 500 Constituents

Rank	Percentile	Company	5-Year Average Return on Equity
161	63%	IPG PHOTONICS CORP	20.3%
162	63%	PUBLIC STORAGE	20.1%
163	63%	AON PLC	20.1%
164	63%	ELECTRONIC ARTS INC	19.8%
165	63%	NETAPP INC	19.8%
166	62%	FLOWSERVE CORP	19.8%
167	62%	FEDEX CORP	19.7%
168	62%	CITRIX SYSTEMS INC	19.4%
169	62%	AMERICAN TOWER CORP	19.4%
170	61%	QUALCOMM INC	19.3%
171	61%	DARDEN RESTAURANTS INC	19.2%
172	61%	SMITH (A.O.) CORP	19.1%
173	61%	CARMAX INC	19.1%
174	61%	HORMEL FOODS CORP	18.9%
175	60%	CONSTELLATION BRANDS INC-A	18.9%
176	60%	WAL-MART STORES INC	18.8%
177	60%	UNITED TECHNOLOGIES CORP	18.7%
178	60%	TOTAL SYSTEM SERVICES INC	18.7%
179	59%	LABORATORY CRP OF AMER HLDGS	18.6%
180	59%	FLEETCOR TECHNOLOGIES INC	18.6%
181	59%	UNITEDHEALTH GROUP INC	18.5%
182	59%	TECHNIPFMC PLC	18.5%
183	59%	EQUIFAX INC	18.4%
184	58%	CIGNA CORP	18.3%
185	58%	MARATHON PETROLEUM CORP	18.3%
186	58%	CONAGRA BRANDS INC	18.1%
187	58%	PARKER HANNIFIN CORP	17.9%
188	57%	WILLIS TOWERS WATSON PLC	17.9%
189	57%	TE CONNECTIVITY LTD	17.8%
190	57%	MICROCHIP TECHNOLOGY INC	17.8%
191	57%	AMETEK INC	17.8%
192	56%	TIFFANY & CO	17.7%
193	56%	ECOLAB INC	17.7%
194	56%	ANALOG DEVICES INC	17.7%
195	56%	RED HAT INC	17.6%
196	56%	CHIPOTLE MEXICAN GRILL INC	17.5%
197	55%	FMC CORP	17.5%
198	55%	PFIZER INC	17.3%
199	55%	AES CORP	17.3%
200	55%	PROCTER & GAMBLE CO/THE	17.0%

Source: Bloomberg and CEI 2017 Form 10-K.

5-Year Average
Return on Equity
For S&P 500 Constituents

Rank	Percentile	Company	5-Year Average Return on Equity
201	54%	TYSON FOODS INC-CL A	17.0%
202	54%	CISCO SYSTEMS INC	16.9%
203	54%	MERCK & CO. INC.	16.9%
204	54%	FLUOR CORP	16.8%
205	54%	DOMINION ENERGY INC	16.7%
206	53%	WALGREENS BOOTS ALLIANCE INC	16.7%
207	53%	CENTENE CORP	16.7%
208	53%	CSX CORP	16.6%
209	53%	HALLIBURTON CO	16.5%
210	52%	UNIVERSAL HEALTH SERVICES-B	16.4%
211	52%	AFFILIATED MANAGERS GROUP	16.4%
212	52%	DAVITA INC	16.3%
213	52%	INTUITIVE SURGICAL INC	16.1%
214	51%	PROGRESSIVE CORP	16.0%
215	51%	AIR PRODUCTS & CHEMICALS INC	16.0%
216	51%	IRON MOUNTAIN INC	16.0%
217	51%	ALBEMARLE CORP	15.9%
218	51%	ADOBE SYSTEMS INC	15.9%
219	50%	DISCOVERY COMMUNICATIONS-A	15.8%
220	50%	DISCOVERY COMMUNICATIONS-C	15.8%
221	50%	JOHNSON CONTROLS INTERNATION	15.8%
222	50%	FACEBOOK INC-A	15.7%
223	49%	INGERSOLL-RAND PLC	15.7%
224	49%	AFLAC INC	15.6%
225	49%	XYLEM INC	15.6%
226	49%	ALPHABET INC-CL C	15.4%
227	49%	ALPHABET INC-CL A	15.4%
228	48%	WESTERN DIGITAL CORP	15.4%
229	48%	DOVER CORP	15.3%
230	48%	COMCAST CORP-CLASS A	15.2%
231	48%	TRIPADVISOR INC	15.1%
232	47%	RALPH LAUREN CORP	15.0%
233	47%	MOHAWK INDUSTRIES INC	14.9%
234	47%	LKQ CORP	14.8%
235	47%	FRANKLIN RESOURCES INC	14.7%
236	46%	QUEST DIAGNOSTICS INC	14.7%
237	46%	DR HORTON INC	14.7%
238	46%	FORTUNE BRANDS HOME & SECURI	14.6%
239	46%	NORFOLK SOUTHERN CORP	14.5%
240	46%	US BANCORP	14.4%

Source: Bloomberg and CEI 2017 Form 10-K.

5-Year Average
Return on Equity
For S&P 500 Constituents

Rank	Percentile	Company	5-Year Average Return on Equity
241	45%	PPL CORP	14.4%
242	45%	ARTHUR J GALLAGHER & CO	14.3%
243	45%	FIRSTENERGY CORP	14.3%
244	45%	CVS HEALTH CORP	14.2%
245	44%	CF INDUSTRIES HOLDINGS INC	14.0%
246	44%	EBAY INC	13.9%
247	44%	VALERO ENERGY CORP	13.8%
248	44%	WILLIAMS COS INC	13.8%
249	44%	CMS ENERGY CORP	13.7%
250	43%	PHILLIPS 66	13.7%
251	43%	NORWEGIAN CRUISE LINE HOLDIN	13.7%
252	43%	KOHLS CORP	13.5%
253	43%	ENTERGY CORP	13.5%
254	42%	FLIR SYSTEMS INC	13.5%
255	42%	ROPER TECHNOLOGIES INC	13.4%
256	42%	BOSTON SCIENTIFIC CORP	13.4%
257	42%	TRAVELERS COS INC/THE	13.4%
258	41%	EATON CORP PLC	13.3%
259	41%	PULTEGROUP INC	13.3%
260	41%	RAYMOND JAMES FINANCIAL INC	13.3%
261	41%	HUMANA INC	13.3%
262	41%	UNDER ARMOUR INC-CLASS C	13.3%
263	40%	UNDER ARMOUR INC-CLASS A	13.3%
264	40%	ALLSTATE CORP	13.2%
265	40%	EVEREST RE GROUP LTD	13.2%
266	40%	AGILENT TECHNOLOGIES INC	13.1%
267	39%	AT&T INC	13.0%
268	39%	CENTERPOINT ENERGY INC	12.9%
269	39%	PVH CORP	12.8%
270	39%	ALEXION PHARMACEUTICALS INC	12.8%
271	39%	SOUTHERN CO/THE	12.7%
272	38%	EDISON INTERNATIONAL	12.7%
273	38%	SCHWAB (CHARLES) CORP	12.7%
274	38%	EXTRA SPACE STORAGE INC	12.7%
275	38%	L3 TECHNOLOGIES INC	12.6%
276	37%	WELLS FARGO & CO	12.5%
277	37%	HILTON WORLDWIDE HOLDINGS IN	12.5%
278	37%	NETFLIX INC	12.4%
279	37%	EXXON MOBIL CORP	12.4%
280	37%	PRINCIPAL FINANCIAL GROUP	12.3%

Source: Bloomberg and CEI 2017 Form 10-K.

5-Year Average
Return on Equity
For S&P 500 Constituents

Rank	Percentile	Company	5-Year Average Return on Equity
281	36%	NIELSEN HOLDINGS PLC	12.2%
282	36%	TORCHMARK CORP	12.1%
283	36%	ANSYS INC	12.1%
284	36%	ABIOMED INC	12.1%
285	35%	EXPEDIA INC	12.0%
286	35%	HOLOGIC INC	12.0%
287	35%	WELLCARE HEALTH PLANS INC	12.0%
288	35%	MEDTRONIC PLC	12.0%
289	34%	FIRST REPUBLIC BANK	12.0%
290	34%	WEC ENERGY GROUP INC	11.9%
291	34%	ACTIVISION BLIZZARD INC	11.9%
292	34%	JM SMUCKER CO/THE	11.8%
293	34%	ZIMMER BIOMET HOLDINGS INC	11.8%
294	33%	NEXTERA ENERGY INC	11.7%
295	33%	SVB FINANCIAL GROUP	11.7%
296	33%	STATE STREET CORP	11.6%
297	33%	DENTSPLY SIRONA INC	11.6%
298	32%	ALLIANT ENERGY CORP	11.5%
299	32%	INVESCO LTD	11.5%
300	32%	FEDERAL REALTY INVS TRUST	11.4%
301	32%	ANTHEM INC	11.4%
302	32%	BLACKROCK INC	11.3%
303	31%	COOPER COS INC/THE	11.2%
304	31%	GOLDMAN SACHS GROUP INC	11.2%
305	31%	HUNTINGTON BANCSHARES INC	11.1%
306	31%	FIFTH THIRD BANCORP	11.0%
307	30%	PRUDENTIAL FINANCIAL INC	11.0%
308	30%	AKAMAI TECHNOLOGIES INC	11.0%
309	30%	NORTHERN TRUST CORP	10.9%
310	30%	JPMORGAN CHASE & CO	10.9%
311	29%	MONDELEZ INTERNATIONAL INC-A	10.8%
312	29%	PERKINELMER INC	10.7%
313	29%	XEROX CORP	10.7%
314	29%	KIMCO REALTY CORP	10.7%
315	29%	FREEPORT-MCMORAN INC	10.7%
316	28%	SCHLUMBERGER LTD	10.5%
317	28%	DTE ENERGY COMPANY	10.5%
318	28%	JUNIPER NETWORKS INC	10.4%
319	28%	XCEL ENERGY INC	10.3%
320	27%	PENTAIR PLC	10.2%

Source: Bloomberg and CEI 2017 Form 10-K.

5-Year Average
Return on Equity
For S&P 500 Constituents

Rank	Percentile	Company	5-Year Average Return on Equity
321	27%	AMERICAN ELECTRIC POWER	10.2%
322	27%	JACOBS ENGINEERING GROUP INC	10.1%
323	27%	CARNIVAL CORP	10.1%
324	27%	SEMPRA ENERGY	10.1%
325	26%	BAXTER INTERNATIONAL INC	10.0%
326	26%	LINCOLN NATIONAL CORP	10.0%
327	26%	WEYERHAEUSER CO	9.9%
328	26%	ASSURANT INC	9.9%
329	25%	PUBLIC SERVICE ENTERPRISE GP	9.9%
330	25%	MATTEL INC	9.8%
331	25%	PINNACLE WEST CAPITAL	9.7%
332	25%	BB&T CORP	9.7%
333	24%	CIMAREX ENERGY CO	9.7%
334	24%	NASDAQ INC	9.7%
335	24%	FIDELITY NATIONAL INFO SERV	9.7%
336	24%	PNC FINANCIAL SERVICES GROUP	9.6%
337	24%	SYNOPSYS INC	9.6%
338	23%	THERMO FISHER SCIENTIFIC INC	9.6%
339	23%	P G & E CORP	9.6%
340	23%	GENERAL ELECTRIC CO	9.6%
341	23%	INTERCONTINENTAL EXCHANGE IN	9.6%
342	22%	CAPITAL ONE FINANCIAL CORP	9.5%
343	22%	AMERICAN WATER WORKS CO INC	9.4%
344	22%	UNUM GROUP	9.4%
345	22%	TAKE-TWO INTERACTIVE SOFTWARI	9.4%
346	22%	KEYCORP	9.3%
347	21%	ABBOTT LABORATORIES	9.3%
348	21%	REPUBLIC SERVICES INC	9.3%
349	21%	KANSAS CITY SOUTHERN	9.3%
350	21%	CHUBB LTD	9.2%
351	20%	CINCINNATI FINANCIAL CORP	9.2%
352	20%	DANAHER CORP	9.2%
353	20%	SYMANTEC CORP	9.0%
354	20%	M & T BANK CORP	9.0%
355	20%	CORNING INC	9.0%
356	**19%**	**CONSOLIDATED EDISON INC**	**9.0%**
357	19%	AMEREN CORPORATION	8.9%
358	19%	HOLLYFRONTIER COPR	8.8%
359	19%	EVERSOURCE ENERGY	8.8%
360	18%	EXELON CORP	8.8%

Source: Bloomberg and CEI 2017 Form 10-K.

5-Year Average
Return on Equity
For S&P 500 Constituents

Rank	Percentile	Company	5-Year Average Return on Equity
361	18%	WESTROCK CO	8.7%
362	18%	HEWLETT PACKARD ENTERPRISE	8.7%
363	18%	NUCOR CORP	8.7%
364	17%	BANK OF NEW YORK MELLON CORP	8.7%
365	17%	PERRIGO CO PLC	8.7%
366	17%	ARCHER-DANIELS-MIDLAND CO	8.6%
367	17%	MGM RESORTS INTERNATIONAL	8.4%
368	17%	MARTIN MARIETTA MATERIALS	8.3%
369	16%	CABOT OIL & GAS CORP	8.2%
370	16%	SUNTRUST BANKS INC	8.1%
371	16%	COMERICA INC	8.0%
372	16%	CITIGROUP INC	7.9%
373	15%	E*TRADE FINANCIAL CORP	7.8%
374	15%	MOSAIC CO/THE	7.7%
375	15%	CME GROUP INC	7.6%
376	15%	MOLSON COORS BREWING CO -B	7.6%
377	15%	DUKE ENERGY CORP	7.6%
378	14%	DIAMONDBACK ENERGY INC	7.5%
379	14%	MORGAN STANLEY	7.4%
380	14%	NISOURCE INC	7.4%
381	14%	CHEVRON CORP	7.3%
382	13%	IHS MARKIT LTD	7.3%
383	13%	REGIONS FINANCIAL CORP	7.3%
384	13%	BANK OF AMERICA CORP	7.2%
385	13%	METLIFE INC	7.0%
386	12%	HARTFORD FINANCIAL SVCS GRP	7.0%
387	12%	FORTINET INC	6.8%
388	12%	BERKSHIRE HATHAWAY INC-CL B	6.5%
389	12%	ZIONS BANCORPORATION	6.4%
390	12%	EQUINIX INC	6.4%
391	11%	QUANTA SERVICES INC	6.3%
392	11%	NEWFIELD EXPLORATION CO	6.3%
393	11%	AMAZON.COM INC	6.2%
394	11%	EOG RESOURCES INC	6.0%
395	10%	HOST HOTELS & RESORTS INC	5.8%
396	10%	BOSTON PROPERTIES INC	5.8%
397	10%	LOEWS CORP	5.7%
398	10%	PEOPLE'S UNITED FINANCIAL	5.7%
399	10%	DUKE REALTY CORP	5.6%
400	9%	DIGITAL REALTY TRUST INC	5.5%

Source: Bloomberg and CEI 2017 Form 10-K.

5-Year Average
Return on Equity
For S&P 500 Constituents

Rank	Percentile	Company	5-Year Average Return on Equity
401	9%	AVALONBAY COMMUNITIES INC	5.5%
402	9%	REGENCY CENTERS CORP	5.3%
403	9%	NEWMONT MINING CORP	5.3%
404	8%	VENTAS INC	5.2%
405	8%	CONCHO RESOURCES INC	5.2%
406	8%	CENTURYLINK INC	5.2%
407	8%	KINDER MORGAN INC	5.0%
408	7%	ESSEX PROPERTY TRUST INC	4.8%
409	7%	NATIONAL OILWELL VARCO INC	4.7%
410	7%	CITIZENS FINANCIAL GROUP	4.7%
411	7%	REALTY INCOME CORP	4.4%
412	7%	VULCAN MATERIALS CO	4.4%
413	6%	HCP INC	4.4%
414	6%	MID-AMERICA APARTMENT COMM	4.2%
415	6%	OCCIDENTAL PETROLEUM CORP	3.8%
416	6%	PIONEER NATURAL RESOURCES CC	3.6%
417	5%	AMERICAN INTERNATIONAL GROUP	3.6%
418	5%	CONOCOPHILLIPS	3.6%
419	5%	JEFFERIES FINANCIAL GROUP INC	3.6%
420	5%	HELMERICH & PAYNE	3.5%
421	5%	DEVON ENERGY CORP	3.3%
422	4%	NOBLE ENERGY INC	3.2%
423	4%	WELLTOWER INC	2.8%
424	4%	ALEXANDRIA REAL ESTATE EQUIT	2.8%
425	4%	VORNADO REALTY TRUST	2.8%
426	3%	MACERICH CO/THE	2.5%
427	3%	EQUITY RESIDENTIAL	2.5%
428	3%	APARTMENT INVT & MGMT CO -A	2.0%
429	3%	UDR INC	1.7%
430	2%	SL GREEN REALTY CORP	1.6%
431	2%	PROLOGIS INC	1.5%
432	2%	NEWS CORP - CLASS B	0.3%
433	2%	NEWS CORP - CLASS A	0.3%
434	2%	APACHE CORP	0.0%
435	1%	MARATHON OIL CORP	-0.8%
436	1%	ANADARKO PETROLEUM CORP	-2.1%
437	1%	ALLERGAN PLC	-2.8%
438	1%	SALESFORCE.COM INC	-3.0%
439	0%	HESS CORP	-3.5%
440	0%	VERTEX PHARMACEUTICALS INC	-16.4%

Source: Bloomberg and CEI 2017 Form 10-K.

5-Year Average
Return on Equity
For S&P 500 Constituents

Rank	Percentile	Company	5-Year Average Return on Equity
441	N/A	AMERICAN AIRLINES GROUP INC	N/A
442	N/A	ADVANCE AUTO PARTS INC	N/A
443	N/A	AUTODESK INC	N/A
444	N/A	ALLEGION PLC	N/A
445	N/A	ADVANCED MICRO DEVICES	N/A
446	N/A	ARCONIC INC	N/A
447	N/A	AVERY DENNISON CORP	N/A
448	N/A	AUTOZONE INC	N/A
449	N/A	BRIGHTHOUSE FINANCIAL INC	N/A
450	N/A	BAKER HUGHES A GE CO	N/A
451	N/A	CROWN CASTLE INTL CORP	N/A
452	N/A	CADENCE DESIGN SYS INC	N/A
453	N/A	CERNER CORP	N/A
454	N/A	CHARTER COMMUNICATIONS INC-A	N/A
455	N/A	COLGATE-PALMOLIVE CO	N/A
456	N/A	DELTA AIR LINES INC	N/A
457	N/A	DOWDUPONT INC	N/A
458	N/A	DXC TECHNOLOGY CO	N/A
459	N/A	EVERGY INC	N/A
460	N/A	FORTIVE CORP	N/A
461	N/A	GARMIN LTD	N/A
462	N/A	GOODYEAR TIRE & RUBBER CO	N/A
463	N/A	HANESBRANDS INC	N/A
464	N/A	HCA HEALTHCARE INC	N/A
465	N/A	HP INC	N/A
466	N/A	H&R BLOCK INC	N/A
467	N/A	HENRY SCHEIN INC	N/A
468	N/A	IDEXX LABORATORIES INC	N/A
469	N/A	INCYTE CORP	N/A
470	N/A	INTEL CORP	N/A
471	N/A	IQVIA HOLDINGS INC	N/A
472	N/A	GARTNER INC	N/A
473	N/A	KELLOGG CO	N/A
474	N/A	KRAFT HEINZ CO/THE	N/A
475	N/A	KIMBERLY-CLARK CORP	N/A
476	N/A	L BRANDS INC	N/A
477	N/A	LENNAR CORP-A	N/A
478	N/A	LINDE PLC	N/A
479	N/A	LOCKHEED MARTIN CORP	N/A
480	N/A	LAMB WESTON HOLDINGS INC	N/A

Source: Bloomberg and CEI 2017 Form 10-K.

5-Year Average
Return on Equity
For S&P 500 Constituents

Rank	Percentile	Company	5-Year Average Return on Equity
481	N/A	MARRIOTT INTERNATIONAL -CL A	N/A
482	N/A	MASCO CORP	N/A
483	N/A	MCDONALD'S CORP	N/A
484	N/A	MOODY'S CORP	N/A
485	N/A	MCCORMICK & CO-NON VTG SHRS	N/A
486	N/A	MOTOROLA SOLUTIONS INC	N/A
487	N/A	NEKTAR THERAPEUTICS	N/A
488	N/A	NRG ENERGY INC	N/A
489	N/A	PEPSICO INC	N/A
490	N/A	PHILIP MORRIS INTERNATIONAL	N/A
491	N/A	PAYPAL HOLDINGS INC	N/A
492	N/A	QORVO INC	N/A
493	N/A	ROYAL CARIBBEAN CRUISES LTD	N/A
494	N/A	SBA COMMUNICATIONS CORP	N/A
495	N/A	SNAP-ON INC	N/A
496	N/A	STANLEY BLACK & DECKER INC	N/A
497	N/A	TRANSDIGM GROUP INC	N/A
498	N/A	TRACTOR SUPPLY COMPANY	N/A
499	N/A	TWITTER INC	N/A
500	N/A	TEXTRON INC	N/A
501	N/A	VF CORP	N/A
502	N/A	VERISIGN INC	N/A
503	N/A	WESTERN UNION CO	N/A
504	N/A	WYNN RESORTS LTD	N/A
505	N/A	YUM! BRANDS INC	N/A

Average	**22.1%**
Median	**15.8%**
Consolidated Edison Co. of NY	**9.2%**

Source: Bloomberg and CEI 2017 Form 10-K.

5-Year Average
Market to Book Capitalization
For S&P 500 Constituents

Rank	Percentile	Company	5-Year Average Price to Book Ratio
1	100%	BOEING CO/THE	128.3x
2	100%	UNITED PARCEL SERVICE-CL B	88.9x
3	100%	CLOROX COMPANY	61.1x
4	99%	S&P GLOBAL INC	60.9x
5	99%	HOME DEPOT INC	50.3x
6	99%	ABBVIE INC	30.9x
7	99%	STARBUCKS CORP	23.3x
8	98%	ALTRIA GROUP INC	21.9x
9	98%	VERTEX PHARMACEUTICALS INC	21.4x
10	98%	ONEOK INC	21.3x
11	98%	QUALCOMM INC	21.2x
12	97%	HERSHEY CO/THE	20.6x
13	97%	SEALED AIR CORP	19.6x
14	97%	VERISK ANALYTICS INC	19.2x
15	97%	AMAZON.COM INC	19.0x
16	97%	MASTERCARD INC - A	19.0x
17	96%	ZOETIS INC	18.7x
18	96%	INTUIT INC	18.6x
19	96%	NETFLIX INC	18.5x
20	96%	METTLER-TOLEDO INTERNATIONAL	17.9x
21	95%	SHERWIN-WILLIAMS CO/THE	17.4x
22	95%	CBOE GLOBAL MARKETS INC	16.2x
23	95%	O'REILLY AUTOMOTIVE INC	15.2x
24	95%	CELGENE CORP	13.4x
25	95%	MSCI INC	13.2x
26	94%	BROWN-FORMAN CORP-CLASS B	13.1x
27	94%	AMERISOURCEBERGEN CORP	12.9x
28	94%	ILLUMINA INC	12.6x
29	94%	DISH NETWORK CORP-A	12.5x
30	93%	KLA-TENCOR CORP	12.3x
31	93%	REGENERON PHARMACEUTICALS	12.3x
32	93%	SIMON PROPERTY GROUP INC	12.1x
33	93%	ROLLINS INC	11.9x
34	92%	ABIOMED INC	11.6x
35	92%	RED HAT INC	11.1x
36	92%	TJX COMPANIES INC	10.3x
37	92%	AUTOMATIC DATA PROCESSING	10.3x
38	92%	PAYCHEX INC	10.2x
39	91%	CAMPBELL SOUP CO	10.1x
40	91%	ACCENTURE PLC-CL A	9.8x

Source: Bloomberg.

5-Year Average
Market to Book Capitalization
For S&P 500 Constituents

Rank	Percentile	Company	5-Year Average Price to Book Ratio
41	91%	AMERICAN TOWER CORP	9.7x
42	91%	INTL BUSINESS MACHINES CORP	9.6x
43	90%	ALLIANCE DATA SYSTEMS CORP	9.4x
44	90%	MONSTER BEVERAGE CORP	9.3x
45	90%	COTY INC-CL A	9.2x
46	90%	SALESFORCE.COM INC	9.2x
47	89%	VERIZON COMMUNICATIONS INC	9.1x
48	89%	ESTEE LAUDER COMPANIES-CL A	9.0x
49	89%	C.H. ROBINSON WORLDWIDE INC	8.9x
50	89%	ROSS STORES INC	8.8x
51	89%	3M CO	8.7x
52	88%	LOWE'S COS INC	8.7x
53	88%	ALIGN TECHNOLOGY INC	8.5x
54	88%	ROCKWELL AUTOMATION INC	8.4x
55	88%	ADOBE SYSTEMS INC	8.4x
56	87%	SYSCO CORP	8.4x
57	87%	CHIPOTLE MEXICAN GRILL INC	8.4x
58	87%	BROADRIDGE FINANCIAL SOLUTIONS INC	8.0x
59	87%	TRIPADVISOR INC	8.0x
60	86%	APTIV PLC	8.0x
61	86%	UNDER ARMOUR INC-CLASS A	7.9x
62	86%	NIKE INC -CL B	7.9x
63	86%	NVIDIA CORP	7.8x
64	86%	ULTA BEAUTY INC	7.7x
65	85%	FORTINET INC	7.7x
66	85%	HUNT (JB) TRANSPRT SVCS INC	7.6x
67	85%	COCA-COLA CO/THE	7.6x
68	85%	ILLINOIS TOOL WORKS	7.6x
69	84%	BOOKING HOLDINGS INC	7.5x
70	84%	NORDSTROM INC	7.5x
71	84%	GILEAD SCIENCES INC	7.3x
72	84%	FASTENAL CO	7.3x
73	84%	VISA INC-CLASS A SHARES	7.3x
74	83%	FISERV INC	7.2x
75	83%	IRON MOUNTAIN INC	7.1x
76	83%	OMNICOM GROUP	7.0x
77	83%	F5 NETWORKS INC	7.0x
78	82%	BRISTOL-MYERS SQUIBB CO	7.0x
79	82%	PUBLIC STORAGE	6.9x
80	82%	FACEBOOK INC-A	6.9x

Source: Bloomberg.

5-Year Average
Market to Book Capitalization
For S&P 500 Constituents

Rank	Percentile	Company	5-Year Average Price to Book Ratio
81	82%	SEAGATE TECHNOLOGY	6.8x
82	81%	ALEXION PHARMACEUTICALS INC	6.7x
83	81%	EDWARDS LIFESCIENCES CORP	6.7x
84	81%	JACK HENRY & ASSOCIATES INC	6.6x
85	81%	BIOGEN INC	6.5x
86	81%	ROBERT HALF INTL INC	6.5x
87	80%	TEXAS INSTRUMENTS INC	6.4x
88	80%	CITRIX SYSTEMS INC	6.4x
89	80%	WW GRAINGER INC	6.4x
90	80%	APPLE INC	6.3x
91	79%	COPART INC	6.2x
92	79%	BALL CORP	6.1x
93	79%	COSTCO WHOLESALE CORP	6.1x
94	79%	ELECTRONIC ARTS INC	6.1x
95	78%	CBS CORP-CLASS B NON VOTING	6.1x
96	78%	CAPRI HOLDINGS	6.0x
97	78%	INTL FLAVORS & FRAGRANCES	5.8x
98	78%	GENERAL MILLS INC	5.7x
99	78%	TWITTER INC	5.7x
100	77%	ELI LILLY & CO	5.7x
101	77%	HILTON WORLDWIDE HOLDINGS IN	5.7x
102	77%	DOLLAR TREE INC	5.7x
103	77%	MICROSOFT CORP	5.7x
104	76%	AMPHENOL CORP-CL A	5.6x
105	76%	NORTHROP GRUMMAN CORP	5.6x
106	76%	XILINX INC	5.5x
107	76%	INTUITIVE SURGICAL INC	5.5x
108	76%	MAXIM INTEGRATED PRODUCTS INC	5.5x
109	75%	VARIAN MEDICAL SYSTEMS INC	5.4x
110	75%	EQUINIX INC	5.4x
111	75%	RESMED INC	5.4x
112	75%	PPG INDUSTRIES INC	5.4x
113	74%	WATERS CORP	5.3x
114	74%	FLEETCOR TECHNOLOGIES INC	5.3x
115	74%	FEDERAL REALTY INVS TRUST	5.3x
116	74%	CABOT OIL & GAS CORP	5.2x
117	73%	BROADCOM LTD	5.2x
118	73%	SMITH (A.O.) CORP	5.2x
119	73%	CINTAS CORP	5.2x
120	73%	CHURCH & DWIGHT CO INC	5.1x

Source: Bloomberg.

5-Year Average
Market to Book Capitalization
For S&P 500 Constituents

Rank	Percentile	Company	5-Year Average Price to Book Ratio
121	73%	MICROCHIP TECHNOLOGY INC	5.1x
122	72%	TAKE-TWO INTERACTIVE SOFTWARE INC	5.1x
123	72%	GLOBAL PAYMENTS INC	5.1x
124	72%	HASBRO INC	5.1x
125	72%	LEGGETT & PLATT INC	4.9x
126	71%	EXPEDITORS INTL WASH INC	4.9x
127	71%	LYONDELLBASELL INDU-CL A	4.9x
128	71%	HARLEY-DAVIDSON INC	4.9x
129	71%	WASTE MANAGEMENT INC	4.8x
130	70%	HONEYWELL INTERNATIONAL INC	4.8x
131	70%	UNITED RENTALS INC	4.8x
132	70%	AON PLC	4.8x
133	70%	EQUIFAX INC	4.7x
134	70%	ECOLAB INC	4.7x
135	69%	MARSH & MCLENNAN COS	4.7x
136	69%	KROGER CO	4.7x
137	69%	TOTAL SYSTEM SERVICES INC	4.7x
138	69%	PACKAGING CORP OF AMERICA	4.6x
139	68%	FMC CORP	4.6x
140	68%	KEYSIGHT TECHNOLOGIES INC	4.5x
141	68%	EMERSON ELECTRIC CO	4.5x
142	68%	APARTMENT INVT & MGMT CO -A	4.5x
143	68%	JOHNSON & JOHNSON	4.5x
144	67%	GAP INC/THE	4.5x
145	67%	EXPEDIA INC	4.5x
146	67%	UNITED CONTINENTAL HOLDINGS	4.4x
147	67%	CROWN CASTLE INTL CORP	4.4x
148	66%	HUNTINGTON INGALLS INDUSTRIE	4.4x
149	66%	HOLOGIC INC	4.4x
150	66%	STRYKER CORP	4.4x
151	66%	SKYWORKS SOLUTIONS INC	4.3x
152	65%	AMGEN INC	4.3x
153	65%	GENUINE PARTS CO	4.3x
154	65%	BECTON DICKINSON AND CO	4.3x
155	65%	DARDEN RESTAURANTS INC	4.2x
156	65%	CBRE GROUP INC - A	4.2x
157	64%	APPLIED MATERIALS INC	4.2x
158	64%	MCKESSON CORP	4.2x
159	64%	NETAPP INC	4.2x
160	64%	ALPHABET INC-CL A	4.2x

Source: Bloomberg.

5-Year Average
Market to Book Capitalization
For S&P 500 Constituents

Rank	Percentile	Company	5-Year Average Price to Book Ratio
161	63%	EXTRA SPACE STORAGE INC	4.2x
162	63%	CONSTELLATION BRANDS INC-A	4.2x
163	63%	IPG PHOTONICS CORP	4.2x
164	63%	AMERICAN EXPRESS CO	4.2x
165	62%	TAPESTRY INC	4.1x
166	62%	T ROWE PRICE GROUP INC	4.1x
167	62%	GENERAL DYNAMICS CORP	4.1x
168	62%	FLOWSERVE CORP	4.1x
169	62%	INTERPUBLIC GROUP OF COS INC	4.1x
170	61%	UNION PACIFIC CORP	4.0x
171	61%	HARRIS CORP	4.0x
172	61%	COGNIZANT TECH SOLUTIONS-A	4.0x
173	61%	MATTEL INC	4.0x
174	60%	HORMEL FOODS CORP	4.0x
175	60%	TWENTY-FIRST CENTURY FOX - B	4.0x
176	60%	TWENTY-FIRST CENTURY FOX-A	4.0x
177	60%	VIACOM INC-CLASS B	4.0x
178	59%	WILLIAMS COS INC	4.0x
179	59%	ANSYS INC	4.0x
180	59%	CELANESE CORP	4.0x
181	59%	CATERPILLAR INC	4.0x
182	59%	INTERNATIONAL PAPER CO	3.9x
183	58%	CONAGRA BRANDS INC	3.9x
184	58%	AMETEK INC	3.9x
185	58%	DEERE & CO	3.9x
186	58%	NEWELL BRANDS INC	3.9x
187	57%	EBAY INC	3.9x
188	57%	RAYTHEON COMPANY	3.9x
189	57%	SCHWAB (CHARLES) CORP	3.8x
190	57%	NEWFIELD EXPLORATION CO	3.8x
191	57%	ORACLE CORP	3.8x
192	56%	DOLLAR GENERAL CORP	3.8x
193	56%	AGILENT TECHNOLOGIES INC	3.8x
194	56%	AIR PRODUCTS & CHEMICALS INC	3.8x
195	56%	PROCTER & GAMBLE CO/THE	3.7x
196	55%	AFFILIATED MANAGERS GROUP	3.7x
197	55%	BAXTER INTERNATIONAL INC	3.7x
198	55%	BOSTON SCIENTIFIC CORP	3.7x
199	55%	VORNADO REALTY TRUST	3.6x
200	54%	CIMAREX ENERGY CO	3.6x

Source: Bloomberg.

5-Year Average
Market to Book Capitalization
For S&P 500 Constituents

Rank	Percentile	Company	5-Year Average Price to Book Ratio
201	54%	MYLAN NV	3.6x
202	54%	XYLEM INC	3.6x
203	54%	TIFFANY & CO	3.6x
204	54%	CARMAX INC	3.6x
205	53%	MERCK & CO. INC.	3.6x
206	53%	CARDINAL HEALTH INC	3.6x
207	53%	WALT DISNEY CO/THE	3.5x
208	53%	ROPER TECHNOLOGIES INC	3.5x
209	52%	HALLIBURTON CO	3.4x
210	52%	FORTUNE BRANDS HOME & SECURI	3.4x
211	52%	SOUTHWEST AIRLINES CO	3.4x
212	52%	UNITEDHEALTH GROUP INC	3.4x
213	51%	ANALOG DEVICES INC	3.4x
214	51%	BOSTON PROPERTIES INC	3.4x
215	51%	AKAMAI TECHNOLOGIES INC	3.4x
216	51%	NIELSEN HOLDINGS PLC	3.4x
217	51%	EOG RESOURCES INC	3.4x
218	50%	SYMANTEC CORP	3.3x
219	50%	PARKER HANNIFIN CORP	3.3x
220	50%	DOMINION ENERGY INC	3.3x
221	50%	COOPER COS INC/THE	3.3x
222	49%	ALASKA AIR GROUP INC	3.3x
223	49%	CUMMINS INC	3.3x
224	49%	UNITED TECHNOLOGIES CORP	3.2x
225	49%	WEYERHAEUSER CO	3.2x
226	49%	DELTA AIR LINES INC	3.2x
227	48%	LKQ CORP	3.2x
228	48%	FEDEX CORP	3.2x
229	48%	WAL-MART STORES INC	3.2x
230	48%	PACCAR INC	3.1x
231	47%	DOVER CORP	3.1x
232	47%	ACTIVISION BLIZZARD INC	3.1x
233	47%	TARGET CORP	3.1x
234	47%	UDR INC	3.1x
235	46%	REGENCY CENTERS CORP	3.1x
236	46%	DIGITAL REALTY TRUST INC	3.0x
237	46%	WILLIS TOWERS WATSON PLC	3.0x
238	46%	SYNOPSYS INC	3.0x
239	46%	BORGWARNER INC	3.0x
240	45%	AMERIPRISE FINANCIAL INC	3.0x

Source: Bloomberg.

5-Year Average
Market to Book Capitalization
For S&P 500 Constituents

Rank	Percentile	Company	5-Year Average Price to Book Ratio
241	45%	BEST BUY CO INC	3.0x
242	45%	ALBEMARLE CORP	3.0x
243	45%	LAM RESEARCH CORP	3.0x
244	44%	PFIZER INC	3.0x
245	44%	DAVITA INC	2.9x
246	44%	ABBOTT LABORATORIES	2.9x
247	44%	APACHE CORP	2.9x
248	43%	FOOT LOCKER INC	2.9x
249	43%	PIONEER NATURAL RESOURCES CO	2.9x
250	43%	WALGREENS BOOTS ALLIANCE INC	2.9x
251	43%	KANSAS CITY SOUTHERN	2.9x
252	43%	CSX CORP	2.9x
253	42%	TECHNIPFMC PLC	2.9x
254	42%	FLIR SYSTEMS INC	2.8x
255	42%	CISCO SYSTEMS INC	2.8x
256	42%	CENTENE CORP	2.8x
257	41%	CIGNA CORP	2.8x
258	41%	VULCAN MATERIALS CO	2.8x
259	41%	EASTMAN CHEMICAL CO	2.8x
260	41%	COMCAST CORP-CLASS A	2.8x
261	41%	INGERSOLL-RAND PLC	2.7x
262	40%	SCHLUMBERGER LTD	2.7x
263	40%	LABORATORY CRP OF AMER HLDGS	2.7x
264	40%	WHIRLPOOL CORP	2.7x
265	40%	NORWEGIAN CRUISE LINE HOLDIN	2.7x
266	39%	PROGRESSIVE CORP	2.7x
267	39%	TE CONNECTIVITY LTD	2.7x
268	39%	DENTSPLY SIRONA INC	2.7x
269	39%	PERKINELMER INC	2.7x
270	38%	MACY'S INC	2.7x
271	38%	MOHAWK INDUSTRIES INC	2.7x
272	38%	PERRIGO CO PLC	2.7x
273	38%	MARTIN MARIETTA MATERIALS	2.6x
274	38%	RALPH LAUREN CORP	2.6x
275	37%	GENERAL ELECTRIC CO	2.6x
276	37%	GOODYEAR TIRE & RUBBER CO	2.6x
277	37%	THERMO FISHER SCIENTIFIC INC	2.6x
278	37%	FLUOR CORP	2.6x
279	36%	WELLCARE HEALTH PLANS INC	2.6x
280	36%	CF INDUSTRIES HOLDINGS INC	2.6x

Source: Bloomberg.

5-Year Average
Market to Book Capitalization
For S&P 500 Constituents

Rank	Percentile	Company	5-Year Average Price to Book Ratio
281	36%	MGM RESORTS INTERNATIONAL	2.6x
282	36%	CMS ENERGY CORP	2.6x
283	35%	HUMANA INC	2.6x
284	35%	ARTHUR J GALLAGHER & CO	2.6x
285	35%	DISCOVER FINANCIAL SERVICES	2.5x
286	35%	ESSEX PROPERTY TRUST INC	2.5x
287	35%	FIDELITY NATIONAL INFO SERV	2.5x
288	34%	UNIVERSAL HEALTH SERVICES-B	2.5x
289	34%	DANAHER CORP	2.5x
290	34%	CENTERPOINT ENERGY INC	2.5x
291	34%	MACERICH CO/THE	2.5x
292	33%	NORFOLK SOUTHERN CORP	2.5x
293	33%	AES CORP	2.5x
294	33%	PENTAIR PLC	2.5x
295	33%	CVS HEALTH CORP	2.4x
296	32%	DIAMONDBACK ENERGY INC	2.4x
297	32%	DISCOVERY COMMUNICATIONS-A	2.4x
298	32%	DISCOVERY COMMUNICATIONS-C	2.4x
299	32%	CONCHO RESOURCES INC	2.4x
300	32%	SVB FINANCIAL GROUP	2.4x
301	31%	QUEST DIAGNOSTICS INC	2.4x
302	31%	ZIMMER BIOMET HOLDINGS INC	2.4x
303	31%	EQUITY RESIDENTIAL	2.4x
304	31%	MONDELEZ INTERNATIONAL INC-A	2.3x
305	30%	KIMCO REALTY CORP	2.3x
306	30%	ANADARKO PETROLEUM CORP	2.3x
307	30%	MEDTRONIC PLC	2.3x
308	30%	JOHNSON CONTROLS INTERNATION	2.3x
309	30%	AVALONBAY COMMUNITIES INC	2.3x
310	29%	DUKE REALTY CORP	2.3x
311	29%	NEXTERA ENERGY INC	2.3x
312	29%	IHS MARKIT LTD	2.3x
313	29%	L3 TECHNOLOGIES INC	2.2x
314	28%	AMERICAN WATER WORKS CO INC	2.2x
315	28%	MARATHON PETROLEUM CORP	2.2x
316	28%	WEC ENERGY GROUP INC	2.2x
317	28%	OCCIDENTAL PETROLEUM CORP	2.2x
318	27%	FREEPORT-MCMORAN INC	2.2x
319	27%	BLACKROCK INC	2.2x
320	27%	EXXON MOBIL CORP	2.2x

Source: Bloomberg.

5-Year Average
Market to Book Capitalization
For S&P 500 Constituents

Rank	Percentile	Company	5-Year Average Price to Book Ratio
321	27%	INTERCONTINENTAL EXCHANGE IN	2.1x
322	27%	NUCOR CORP	2.1x
323	26%	REPUBLIC SERVICES INC	2.1x
324	26%	ALLIANT ENERGY CORP	2.1x
325	26%	FIRST REPUBLIC BANK	2.1x
326	26%	NORTHERN TRUST CORP	2.1x
327	25%	SEMPRA ENERGY	2.1x
328	25%	VENTAS INC	2.1x
329	25%	ROYAL CARIBBEAN CRUISES LTD	2.1x
330	25%	REALTY INCOME CORP	2.1x
331	24%	TYSON FOODS INC-CL A	2.1x
332	24%	HOST HOTELS & RESORTS INC	2.0x
333	24%	SOUTHERN CO/THE	2.0x
334	24%	HCP INC	2.0x
335	24%	JUNIPER NETWORKS INC	2.0x
336	23%	MICRON TECHNOLOGY INC	2.0x
337	23%	US BANCORP	2.0x
338	23%	FRANKLIN RESOURCES INC	2.0x
339	23%	PPL CORP	2.0x
340	22%	WESTERN DIGITAL CORP	2.0x
341	22%	FORD MOTOR CO	2.0x
342	22%	EATON CORP PLC	2.0x
343	22%	PHILLIPS 66	2.0x
344	22%	JM SMUCKER CO/THE	2.0x
345	21%	DEVON ENERGY CORP	1.9x
346	21%	AT&T INC	1.9x
347	21%	RAYMOND JAMES FINANCIAL INC	1.9x
348	21%	MID-AMERICA APARTMENT COMM	1.9x
349	20%	NISOURCE INC	1.9x
350	20%	ALEXANDRIA REAL ESTATE EQUIT	1.9x
351	20%	PVH CORP	1.9x
352	20%	FIRSTENERGY CORP	1.8x
353	19%	WELLTOWER INC	1.8x
354	19%	KINDER MORGAN INC	1.8x
355	19%	INVESCO LTD	1.8x
356	19%	DTE ENERGY COMPANY	1.8x
357	19%	ALLERGAN PLC	1.8x
358	18%	MOLSON COORS BREWING CO -B	1.8x
359	18%	XCEL ENERGY INC	1.8x
360	18%	NOBLE ENERGY INC	1.8x

Source: Bloomberg.

5-Year Average
Market to Book Capitalization
For S&P 500 Constituents

Rank	Percentile	Company	5-Year Average Price to Book Ratio
361	18%	EDISON INTERNATIONAL	1.8x
362	17%	KOHLS CORP	1.8x
363	17%	DR HORTON INC	1.7x
364	17%	CONOCOPHILLIPS	1.7x
365	17%	TORCHMARK CORP	1.7x
366	16%	AMERICAN ELECTRIC POWER	1.7x
367	16%	PROLOGIS INC	1.7x
368	16%	NASDAQ INC	1.7x
369	16%	PINNACLE WEST CAPITAL	1.7x
370	16%	CARNIVAL CORP	1.7x
371	15%	AMEREN CORPORATION	1.7x
372	15%	CME GROUP INC	1.7x
373	15%	STATE STREET CORP	1.7x
374	15%	PULTEGROUP INC	1.6x
375	14%	PUBLIC SERVICE ENTERPRISE GP	1.6x
376	14%	WELLS FARGO & CO	1.6x
377	14%	EVERSOURCE ENERGY	1.6x
378	14%	HELMERICH & PAYNE	1.6x
379	14%	PRINCIPAL FINANCIAL GROUP	1.6x
380	13%	AFLAC INC	1.6x
381	13%	SL GREEN REALTY CORP	1.6x
382	13%	ANTHEM INC	1.5x
383	13%	E*TRADE FINANCIAL CORP	1.5x
384	12%	M & T BANK CORP	1.5x
385	**12%**	**CONSOLIDATED EDISON INC**	**1.5x**
386	12%	VALERO ENERGY CORP	1.5x
387	12%	ENTERGY CORP	1.5x
388	11%	CINCINNATI FINANCIAL CORP	1.5x
389	11%	JACOBS ENGINEERING GROUP INC	1.5x
390	11%	CORNING INC	1.5x
391	11%	HUNTINGTON BANCSHARES INC	1.5x
392	11%	P G & E CORP	1.5x
393	10%	HOLLYFRONTIER COPR	1.5x
394	10%	CHEVRON CORP	1.4x
395	10%	ALLSTATE CORP	1.4x
396	10%	GENERAL MOTORS CO	1.4x
397	9%	TRAVELERS COS INC/THE	1.4x
398	9%	ARCHER-DANIELS-MIDLAND CO	1.4x
399	9%	QUANTA SERVICES INC	1.4x
400	9%	COMERICA INC	1.3x

Source: Bloomberg.

5-Year Average
Market to Book Capitalization
For S&P 500 Constituents

Rank	Percentile	Company	5-Year Average Price to Book Ratio
401	8%	BB&T CORP	1.3x
402	8%	DUKE ENERGY CORP	1.3x
403	8%	BANK OF NEW YORK MELLON CORP	1.3x
404	8%	NEWMONT MINING CORP	1.3x
405	8%	CHUBB LTD	1.3x
406	7%	MOSAIC CO/THE	1.3x
407	7%	FIFTH THIRD BANCORP	1.3x
408	7%	PNC FINANCIAL SERVICES GROUP	1.3x
409	7%	JPMORGAN CHASE & CO	1.2x
410	6%	KEYCORP	1.2x
411	6%	EXELON CORP	1.2x
412	6%	GOLDMAN SACHS GROUP INC	1.2x
413	6%	XEROX CORP	1.1x
414	5%	NATIONAL OILWELL VARCO INC	1.1x
415	5%	HESS CORP	1.1x
416	5%	ASSURANT INC	1.1x
417	5%	MORGAN STANLEY	1.1x
418	5%	SUNTRUST BANKS INC	1.1x
419	4%	ZIONS BANCORPORATION	1.1x
420	4%	UNUM GROUP	1.1x
421	4%	PEOPLE'S UNITED FINANCIAL	1.1x
422	4%	HARTFORD FINANCIAL SVCS GRP	1.1x
423	3%	EVEREST RE GROUP LTD	1.1x
424	3%	CENTURYLINK INC	1.1x
425	3%	CAPITAL ONE FINANCIAL CORP	1.0x
426	3%	REGIONS FINANCIAL CORP	1.0x
427	3%	PRUDENTIAL FINANCIAL INC	1.0x
428	2%	LINCOLN NATIONAL CORP	1.0x
429	2%	MARATHON OIL CORP	0.9x
430	2%	METLIFE INC	0.9x
431	2%	BANK OF AMERICA CORP	0.9x
432	1%	LOEWS CORP	0.8x
433	1%	CITIGROUP INC	0.8x
434	1%	JEFFERIES FINANCIAL GROUP INC	0.8x
435	1%	AMERICAN INTERNATIONAL GROUP	0.8x
436	0%	NEWS CORP - CLASS B	0.8x
437	0%	NEWS CORP - CLASS A	0.8x
438	N/A	AMERICAN AIRLINES GROUP INC	N/A
439	N/A	ADVANCE AUTO PARTS INC	N/A
440	N/A	AUTODESK INC	N/A

Source: Bloomberg.

5-Year Average
Market to Book Capitalization
For S&P 500 Constituents

Rank	Percentile	Company	5-Year Average Price to Book Ratio
441	N/A	ALLEGION PLC	N/A
442	N/A	ADVANCED MICRO DEVICES	N/A
443	N/A	ARISTA NETWORKS INC	N/A
444	N/A	ARCONIC INC	N/A
445	N/A	AVERY DENNISON CORP	N/A
446	N/A	AUTOZONE INC	N/A
447	N/A	BRIGHTHOUSE FINANCIAL INC	N/A
448	N/A	BAKER HUGHES A GE CO	N/A
449	N/A	BERKSHIRE HATHAWAY INC-CL B	N/A
450	N/A	CADENCE DESIGN SYS INC	N/A
451	N/A	CERNER CORP	N/A
452	N/A	CITIZENS FINANCIAL GROUP	N/A
453	N/A	CHARTER COMMUNICATIONS INC-A	N/A
454	N/A	COLGATE-PALMOLIVE CO	N/A
455	N/A	DOWDUPONT INC	N/A
456	N/A	DXC TECHNOLOGY CO	N/A
457	N/A	EVERGY INC	N/A
458	N/A	FORTIVE CORP	N/A
459	N/A	ALPHABET INC-CL C	N/A
460	N/A	GARMIN LTD	N/A
461	N/A	HANESBRANDS INC	N/A
462	N/A	HCA HEALTHCARE INC	N/A
463	N/A	HEWLETT PACKARD ENTERPRISE	N/A
464	N/A	HP INC	N/A
465	N/A	H&R BLOCK INC	N/A
466	N/A	HENRY SCHEIN INC	N/A
467	N/A	IDEXX LABORATORIES INC	N/A
468	N/A	INCYTE CORP	N/A
469	N/A	INTEL CORP	N/A
470	N/A	IQVIA HOLDINGS INC	N/A
471	N/A	GARTNER INC	N/A
472	N/A	KELLOGG CO	N/A
473	N/A	KRAFT HEINZ CO/THE	N/A
474	N/A	KIMBERLY-CLARK CORP	N/A
475	N/A	L BRANDS INC	N/A
476	N/A	LENNAR CORP-A	N/A
477	N/A	LINDE PLC	N/A
478	N/A	LOCKHEED MARTIN CORP	N/A
479	N/A	LAMB WESTON HOLDINGS INC	N/A
480	N/A	MARRIOTT INTERNATIONAL -CL A	N/A

Source: Bloomberg.

5-Year Average
Market to Book Capitalization
For S&P 500 Constituents

Rank	Percentile	Company	5-Year Average Price to Book Ratio
481	N/A	MASCO CORP	N/A
482	N/A	MCDONALD'S CORP	N/A
483	N/A	MOODY'S CORP	N/A
484	N/A	MCCORMICK & CO-NON VTG SHRS	N/A
485	N/A	MOTOROLA SOLUTIONS INC	N/A
486	N/A	NEKTAR THERAPEUTICS	N/A
487	N/A	NRG ENERGY INC	N/A
488	N/A	PEPSICO INC	N/A
489	N/A	PHILIP MORRIS INTERNATIONAL	N/A
490	N/A	PAYPAL HOLDINGS INC	N/A
491	N/A	QORVO INC	N/A
492	N/A	SBA COMMUNICATIONS CORP	N/A
493	N/A	SNAP-ON INC	N/A
494	N/A	STANLEY BLACK & DECKER INC	N/A
495	N/A	SYNCHRONY FINANCIAL	N/A
496	N/A	TRANSDIGM GROUP INC	N/A
497	N/A	TRACTOR SUPPLY COMPANY	N/A
498	N/A	TEXTRON INC	N/A
499	N/A	UNDER ARMOUR INC-CLASS C	N/A
500	N/A	VF CORP	N/A
501	N/A	VERISIGN INC	N/A
502	N/A	WESTROCK CO	N/A
503	N/A	WESTERN UNION CO	N/A
504	N/A	WYNN RESORTS LTD	N/A
505	N/A	YUM! BRANDS INC	N/A

Average	**5.4x**
Median	**3.3x**

Source: Bloomberg.

Consensus Analyst Recommendation
As of 1/14/19
For S&P 500 Constituents

Rank	Percentile	Company	Analyst Recommendation
1	100%	ABIOMED INC	5.0
2	100%	ASSURANT INC	5.0
3	100%	JEFFERIES FINANCIAL GROUP INC	5.0
4	99%	KEYSIGHT TECHNOLOGIES INC	5.0
5	99%	MARATHON PETROLEUM CORP	5.0
6	99%	DIAMONDBACK ENERGY INC	4.9
7	99%	LKQ CORP	4.9
8	99%	AMETEK INC	4.9
9	98%	ALPHABET INC-CL A	4.9
10	98%	HARRIS CORP	4.8
11	98%	PIONEER NATURAL RESOURCES CO	4.8
12	98%	SALESFORCE.COM INC	4.8
13	98%	E*TRADE FINANCIAL CORP	4.8
14	97%	AMAZON.COM INC	4.8
15	97%	LENNAR CORP-A	4.8
16	97%	ALEXION PHARMACEUTICALS INC	4.8
17	97%	SYNOPSYS INC	4.8
18	97%	EQUINIX INC	4.8
19	96%	UNITEDHEALTH GROUP INC	4.8
20	96%	JACOBS ENGINEERING GROUP INC	4.8
21	96%	ALIGN TECHNOLOGY INC	4.8
22	96%	ALPHABET INC-CL C	4.8
23	96%	VISA INC-CLASS A SHARES	4.7
24	95%	MICROSOFT CORP	4.7
25	95%	CITIZENS FINANCIAL GROUP	4.7
26	95%	NORWEGIAN CRUISE LINE HOLDIN	4.7
27	95%	PVH CORP	4.7
28	95%	ANADARKO PETROLEUM CORP	4.7
29	94%	HALLIBURTON CO	4.7
30	94%	BOSTON SCIENTIFIC CORP	4.7
31	94%	FLEETCOR TECHNOLOGIES INC	4.7
32	94%	MASTERCARD INC - A	4.7
33	94%	CONCHO RESOURCES INC	4.7
34	93%	DELTA AIR LINES INC	4.7
35	93%	QUANTA SERVICES INC	4.7
36	93%	WELLCARE HEALTH PLANS INC	4.7
37	93%	ROYAL CARIBBEAN CRUISES LTD	4.7
38	93%	WILLIAMS COS INC	4.7
39	92%	MASCO CORP	4.6
40	92%	TAKE-TWO INTERACTIVE SOFTWARE INC	4.6

Source: Bloomberg.

Consensus Analyst Recommendation
As of 1/14/19
For S&P 500 Constituents

Rank	Percentile	Company	Analyst Recommendation
41	92%	BLACKROCK INC	4.6
42	92%	CENTENE CORP	4.6
43	92%	MONDELEZ INTERNATIONAL INC-A	4.6
44	91%	CVS HEALTH CORP	4.6
45	91%	AGILENT TECHNOLOGIES INC	4.6
46	91%	CONAGRA BRANDS INC	4.6
47	91%	PROLOGIS INC	4.6
48	91%	CONSTELLATION BRANDS INC-A	4.6
49	90%	FEDEX CORP	4.6
50	90%	INTERCONTINENTAL EXCHANGE IN	4.6
51	90%	MICROCHIP TECHNOLOGY INC	4.6
52	90%	KINDER MORGAN INC	4.6
53	90%	PAYPAL HOLDINGS INC	4.6
54	89%	GLOBAL PAYMENTS INC	4.6
55	89%	HONEYWELL INTERNATIONAL INC	4.6
56	89%	MYLAN NV	4.6
57	89%	THERMO FISHER SCIENTIFIC INC	4.6
58	89%	DOWDUPONT INC	4.6
59	88%	ELECTRONIC ARTS INC	4.5
60	88%	ANTHEM INC	4.5
61	88%	AIR PRODUCTS & CHEMICALS INC	4.5
62	88%	SEMPRA ENERGY	4.5
63	88%	BAKER HUGHES A GE CO	4.5
64	88%	CITIGROUP INC	4.5
65	87%	MCDONALD'S CORP	4.5
66	87%	MERCK & CO. INC.	4.5
67	87%	NUCOR CORP	4.5
68	87%	TE CONNECTIVITY LTD	4.5
69	87%	DANAHER CORP	4.5
70	86%	ABBOTT LABORATORIES	4.5
71	86%	CAPITAL ONE FINANCIAL CORP	4.5
72	86%	HILTON WORLDWIDE HOLDINGS IN	4.5
73	86%	AVERY DENNISON CORP	4.5
74	86%	CIGNA CORP	4.5
75	85%	COMCAST CORP-CLASS A	4.5
76	85%	TWENTY-FIRST CENTURY FOX - B	4.5
77	85%	CARMAX INC	4.5
78	85%	NEKTAR THERAPEUTICS	4.5
79	85%	VERTEX PHARMACEUTICALS INC	4.5
80	84%	ALLERGAN PLC	4.5

Source: Bloomberg.

Consensus Analyst Recommendation
As of 1/14/19
For S&P 500 Constituents

Rank	Percentile	Company	Analyst Recommendation
81	84%	HUMANA INC	4.5
82	84%	SVB FINANCIAL GROUP	4.5
83	84%	BROADCOM LTD	4.5
84	84%	PRUDENTIAL FINANCIAL INC	4.5
85	83%	BOEING CO/THE	4.5
86	83%	EOG RESOURCES INC	4.5
87	83%	TAPESTRY INC	4.5
88	83%	ADOBE SYSTEMS INC	4.5
89	83%	IQVIA HOLDINGS INC	4.5
90	82%	NRG ENERGY INC	4.5
91	82%	SIMON PROPERTY GROUP INC	4.5
92	82%	AMERICAN AIRLINES GROUP INC	4.5
93	82%	AMERICAN INTERNATIONAL GROUP	4.4
94	82%	REGENCY CENTERS CORP	4.4
95	81%	VULCAN MATERIALS CO	4.4
96	81%	ACTIVISION BLIZZARD INC	4.4
97	81%	LOWE'S COS INC	4.4
98	81%	FMC CORP	4.4
99	81%	AMPHENOL CORP-CL A	4.4
100	80%	FIDELITY NATIONAL INFO SERV	4.4
101	80%	KLA-TENCOR CORP	4.4
102	80%	L3 TECHNOLOGIES INC	4.4
103	80%	STANLEY BLACK & DECKER INC	4.4
104	80%	TEXTRON INC	4.4
105	79%	BIOGEN INC	4.4
106	79%	CARNIVAL CORP	4.4
107	79%	INGERSOLL-RAND PLC	4.4
108	79%	APTIV PLC	4.4
109	79%	CHARTER COMMUNICATIONS INC-A	4.4
110	78%	MORGAN STANLEY	4.4
111	78%	HOME DEPOT INC	4.4
112	78%	SEALED AIR CORP	4.4
113	78%	DISCOVER FINANCIAL SERVICES	4.4
114	78%	DR HORTON INC	4.4
115	77%	NEXTERA ENERGY INC	4.4
116	77%	BANK OF AMERICA CORP	4.4
117	77%	DEERE & CO	4.4
118	77%	CHEVRON CORP	4.4
119	77%	NVIDIA CORP	4.4
120	76%	RAYTHEON COMPANY	4.4

Source: Bloomberg.

Consensus Analyst Recommendation
As of 1/14/19
For S&P 500 Constituents

Rank	Percentile	Company	Analyst Recommendation
121	76%	ESTEE LAUDER COMPANIES-CL A	4.4
122	76%	TECHNIPFMC PLC	4.4
123	76%	BAXTER INTERNATIONAL INC	4.4
124	76%	FIRSTENERGY CORP	4.4
125	75%	ILLUMINA INC	4.4
126	75%	MARATHON OIL CORP	4.4
127	75%	NORTHROP GRUMMAN CORP	4.4
128	75%	VALERO ENERGY CORP	4.4
129	75%	AUTODESK INC	4.4
130	74%	CIMAREX ENERGY CO	4.4
131	74%	FACEBOOK INC-A	4.4
132	74%	KEYCORP	4.3
133	74%	VF CORP	4.3
134	74%	AMERIPRISE FINANCIAL INC	4.3
135	73%	BORGWARNER INC	4.3
136	73%	FLIR SYSTEMS INC	4.3
137	73%	INCYTE CORP	4.3
138	73%	LAM RESEARCH CORP	4.3
139	73%	MGM RESORTS INTERNATIONAL	4.3
140	72%	OCCIDENTAL PETROLEUM CORP	4.3
141	72%	SBA COMMUNICATIONS CORP	4.3
142	72%	SCHWAB (CHARLES) CORP	4.3
143	72%	ULTA BEAUTY INC	4.3
144	72%	WASTE MANAGEMENT INC	4.3
145	71%	STRYKER CORP	4.3
146	71%	GENERAL MOTORS CO	4.3
147	71%	O'REILLY AUTOMOTIVE INC	4.3
148	71%	STATE STREET CORP	4.3
149	71%	PUBLIC SERVICE ENTERPRISE GP	4.3
150	70%	S&P GLOBAL INC	4.3
151	70%	APPLIED MATERIALS INC	4.3
152	70%	LEGGETT & PLATT INC	4.3
153	70%	MOTOROLA SOLUTIONS INC	4.3
154	70%	EXPEDIA INC	4.3
155	69%	BECTON DICKINSON AND CO	4.3
156	69%	ONEOK INC	4.3
157	69%	DOLLAR TREE INC	4.3
158	69%	EASTMAN CHEMICAL CO	4.3
159	69%	XYLEM INC	4.3
160	68%	LOCKHEED MARTIN CORP	4.3

Source: Bloomberg.

Consensus Analyst Recommendation
As of 1/14/19
For S&P 500 Constituents

Rank	Percentile	Company	Analyst Recommendation
161	68%	ZIONS BANCORPORATION	4.3
162	68%	ALASKA AIR GROUP INC	4.3
163	68%	ALEXANDRIA REAL ESTATE EQUIT	4.3
164	68%	HP INC	4.3
165	67%	IDEXX LABORATORIES INC	4.3
166	67%	CATERPILLAR INC	4.2
167	67%	DOLLAR GENERAL CORP	4.2
168	67%	GILEAD SCIENCES INC	4.2
169	67%	TJX COMPANIES INC	4.2
170	66%	KANSAS CITY SOUTHERN	4.2
171	66%	NOBLE ENERGY INC	4.2
172	66%	SHERWIN-WILLIAMS CO/THE	4.2
173	66%	ALBEMARLE CORP	4.2
174	66%	DAVITA INC	4.2
175	65%	NIKE INC -CL B	4.2
176	65%	FEDERAL REALTY INVS TRUST	4.2
177	65%	DIGITAL REALTY TRUST INC	4.2
178	65%	SOUTHWEST AIRLINES CO	4.2
179	65%	HCA HEALTHCARE INC	4.2
180	64%	CISCO SYSTEMS INC	4.2
181	64%	COGNIZANT TECH SOLUTIONS-A	4.2
182	64%	BOOKING HOLDINGS INC	4.2
183	64%	ALLIANCE DATA SYSTEMS CORP	4.2
184	64%	DEVON ENERGY CORP	4.2
185	63%	AFFILIATED MANAGERS GROUP	4.2
186	63%	BERKSHIRE HATHAWAY INC-CL B	4.2
187	63%	PROGRESSIVE CORP	4.2
188	63%	PHILLIPS 66	4.2
189	63%	UNITED RENTALS INC	4.2
190	63%	WILLIS TOWERS WATSON PLC	4.2
191	62%	ZOETIS INC	4.2
192	62%	TOTAL SYSTEM SERVICES INC	4.2
193	62%	DXC TECHNOLOGY CO	4.2
194	62%	CELANESE CORP	4.2
195	62%	SCHLUMBERGER LTD	4.2
196	61%	ADVANCE AUTO PARTS INC	4.2
197	61%	ALLEGION PLC	4.2
198	61%	WALT DISNEY CO/THE	4.2
199	61%	WEYERHAEUSER CO	4.2
200	61%	NETFLIX INC	4.2

Source: Bloomberg.

Consensus Analyst Recommendation
As of 1/14/19
For S&P 500 Constituents

Rank	Percentile	Company	Analyst Recommendation
201	60%	MEDTRONIC PLC	4.2
202	60%	IHS MARKIT LTD	4.2
203	60%	METLIFE INC	4.2
204	60%	MONSTER BEVERAGE CORP	4.2
205	60%	CBS CORP-CLASS B NON VOTING	4.2
206	59%	DARDEN RESTAURANTS INC	4.2
207	59%	ESSEX PROPERTY TRUST INC	4.2
208	59%	CSX CORP	4.1
209	59%	MICRON TECHNOLOGY INC	4.1
210	59%	BALL CORP	4.1
211	58%	INTUITIVE SURGICAL INC	4.1
212	58%	UNITED TECHNOLOGIES CORP	4.1
213	58%	COSTCO WHOLESALE CORP	4.1
214	58%	LINCOLN NATIONAL CORP	4.1
215	58%	TRANSDIGM GROUP INC	4.1
216	57%	TYSON FOODS INC-CL A	4.1
217	57%	MARTIN MARIETTA MATERIALS	4.1
218	57%	CADENCE DESIGN SYS INC	4.1
219	57%	DUKE REALTY CORP	4.1
220	57%	EQUIFAX INC	4.1
221	56%	ACCENTURE PLC-CL A	4.1
222	56%	SUNTRUST BANKS INC	4.1
223	56%	AMERICAN ELECTRIC POWER	4.1
224	56%	FORTUNE BRANDS HOME & SECURI	4.1
225	56%	HARTFORD FINANCIAL SVCS GRP	4.1
226	55%	LABORATORY CRP OF AMER HLDGS	4.1
227	55%	UNIVERSAL HEALTH SERVICES-B	4.1
228	55%	UNION PACIFIC CORP	4.1
229	55%	CHUBB LTD	4.1
230	55%	CBRE GROUP INC - A	4.1
231	54%	CELGENE CORP	4.1
232	54%	GARTNER INC	4.1
233	54%	BOSTON PROPERTIES INC	4.1
234	54%	SYNCHRONY FINANCIAL	4.1
235	54%	SMITH (A.O.) CORP	4.1
236	53%	EATON CORP PLC	4.1
237	53%	ROSS STORES INC	4.1
238	53%	CBOE GLOBAL MARKETS INC	4.1
239	53%	FLUOR CORP	4.1
240	53%	NETAPP INC	4.1

Source: Bloomberg.

Consensus Analyst Recommendation
As of 1/14/19
For S&P 500 Constituents

Rank	Percentile	Company	Analyst Recommendation
241	52%	TIFFANY & CO	4.1
242	52%	ARISTA NETWORKS INC	4.1
243	52%	AMERISOURCEBERGEN CORP	4.1
244	52%	FORTIVE CORP	4.1
245	52%	NIELSEN HOLDINGS PLC	4.1
246	51%	CF INDUSTRIES HOLDINGS INC	4.1
247	51%	AMERICAN TOWER CORP	4.0
248	51%	CONOCOPHILLIPS	4.0
249	51%	AKAMAI TECHNOLOGIES INC	4.0
250	51%	COCA-COLA CO/THE	4.0
251	50%	QUALCOMM INC	4.0
252	50%	STARBUCKS CORP	4.0
253	50%	APPLE INC	4.0
254	50%	COMERICA INC	4.0
255	50%	COOPER COS INC/THE	4.0
256	49%	EMERSON ELECTRIC CO	4.0
257	49%	ENTERGY CORP	4.0
258	49%	TWENTY-FIRST CENTURY FOX-A	4.0
259	49%	GENERAL DYNAMICS CORP	4.0
260	49%	HASBRO INC	4.0
261	48%	IPG PHOTONICS CORP	4.0
262	48%	PARKER HANNIFIN CORP	4.0
263	48%	RAYMOND JAMES FINANCIAL INC	4.0
264	48%	ROLLINS INC	4.0
265	48%	ROPER TECHNOLOGIES INC	4.0
266	47%	SNAP-ON INC	4.0
267	47%	UNITED CONTINENTAL HOLDINGS	4.0
268	47%	WYNN RESORTS LTD	4.0
269	47%	XEROX CORP	4.0
270	47%	EDWARDS LIFESCIENCES CORP	4.0
271	46%	KRAFT HEINZ CO/THE	4.0
272	46%	EXELON CORP	4.0
273	46%	PHILIP MORRIS INTERNATIONAL	4.0
274	46%	SL GREEN REALTY CORP	4.0
275	46%	CROWN CASTLE INTL CORP	3.9
276	45%	EDISON INTERNATIONAL	3.9
277	45%	ARTHUR J GALLAGHER & CO	3.9
278	45%	AMERICAN WATER WORKS CO INC	3.9
279	45%	INTERPUBLIC GROUP OF COS INC	3.9
280	45%	DISCOVERY COMMUNICATIONS-A	3.9

Source: Bloomberg.

Consensus Analyst Recommendation
As of 1/14/19
For S&P 500 Constituents

Rank	Percentile	Company	Analyst Recommendation
281	44%	TRACTOR SUPPLY COMPANY	3.9
282	44%	ANALOG DEVICES INC	3.9
283	44%	MARRIOTT INTERNATIONAL -CL A	3.9
284	44%	CERNER CORP	3.9
285	44%	FOOT LOCKER INC	3.9
286	43%	DOVER CORP	3.9
287	43%	EVERGY INC	3.9
288	43%	JPMORGAN CHASE & CO	3.9
289	43%	ZIMMER BIOMET HOLDINGS INC	3.9
290	43%	QUEST DIAGNOSTICS INC	3.9
291	42%	SKYWORKS SOLUTIONS INC	3.9
292	42%	NORFOLK SOUTHERN CORP	3.9
293	42%	MID-AMERICA APARTMENT COMM	3.9
294	42%	VERISK ANALYTICS INC	3.9
295	42%	WELLS FARGO & CO	3.9
296	41%	HESS CORP	3.9
297	41%	NISOURCE INC	3.9
298	41%	HUNTINGTON BANCSHARES INC	3.9
299	41%	ALLSTATE CORP	3.9
300	41%	CAPRI HOLDINGS	3.9
301	40%	INTUIT INC	3.9
302	40%	JOHNSON & JOHNSON	3.9
303	40%	PACKAGING CORP OF AMERICA	3.9
304	40%	WAL-MART STORES INC	3.8
305	40%	AMGEN INC	3.8
306	39%	CORNING INC	3.8
307	39%	MOLSON COORS BREWING CO -B	3.8
308	39%	HUNT (JB) TRANSPRT SVCS INC	3.8
309	39%	ARCONIC INC	3.8
310	39%	AVALONBAY COMMUNITIES INC	3.8
311	38%	AUTOZONE INC	3.8
312	38%	MSCI INC	3.8
313	38%	CENTERPOINT ENERGY INC	3.8
314	38%	HANESBRANDS INC	3.8
315	38%	NASDAQ INC	3.8
316	38%	SYSCO CORP	3.8
317	37%	AT&T INC	3.8
318	37%	BB&T CORP	3.8
319	37%	PNC FINANCIAL SERVICES GROUP	3.8
320	37%	PPG INDUSTRIES INC	3.8

Source: Bloomberg.

Consensus Analyst Recommendation
As of 1/14/19
For S&P 500 Constituents

Rank	Percentile	Company	Analyst Recommendation
321	37%	YUM! BRANDS INC	3.8
322	36%	CABOT OIL & GAS CORP	3.8
323	36%	ARCHER-DANIELS-MIDLAND CO	3.8
324	36%	HUNTINGTON INGALLS INDUSTRIE	3.8
325	36%	VORNADO REALTY TRUST	3.8
326	36%	WESTROCK CO	3.8
327	35%	XILINX INC	3.8
328	35%	MOSAIC CO/THE	3.8
329	35%	GOLDMAN SACHS GROUP INC	3.8
330	35%	EBAY INC	3.8
331	35%	ECOLAB INC	3.8
332	34%	FISERV INC	3.8
333	34%	CME GROUP INC	3.8
334	34%	NEWMONT MINING CORP	3.8
335	34%	TEXAS INSTRUMENTS INC	3.8
336	34%	QORVO INC	3.8
337	33%	HCP INC	3.8
338	33%	HOLOGIC INC	3.8
339	33%	DOMINION ENERGY INC	3.8
340	33%	INTERNATIONAL PAPER CO	3.8
341	33%	REGIONS FINANCIAL CORP	3.8
342	32%	WELLTOWER INC	3.8
343	32%	EVERSOURCE ENERGY	3.7
344	32%	ELI LILLY & CO	3.7
345	32%	ALTRIA GROUP INC	3.7
346	32%	GOODYEAR TIRE & RUBBER CO	3.7
347	31%	VERIZON COMMUNICATIONS INC	3.7
348	31%	NEWFIELD EXPLORATION CO	3.7
349	31%	REGENERON PHARMACEUTICALS	3.7
350	31%	ORACLE CORP	3.7
351	31%	DENTSPLY SIRONA INC	3.7
352	30%	INVESCO LTD	3.7
353	30%	DISH NETWORK CORP-A	3.7
354	30%	FIRST REPUBLIC BANK	3.7
355	30%	GENERAL ELECTRIC CO	3.7
356	30%	LINDE PLC	3.7
357	29%	PROCTER & GAMBLE CO/THE	3.7
358	29%	RED HAT INC	3.7
359	29%	AON PLC	3.7
360	29%	BRISTOL-MYERS SQUIBB CO	3.7

Source: Bloomberg.

Consensus Analyst Recommendation
As of 1/14/19
For S&P 500 Constituents

Rank	Percentile	Company	Analyst Recommendation
361	29%	CMS ENERGY CORP	3.7
362	28%	DISCOVERY COMMUNICATIONS-C	3.7
363	28%	LOEWS CORP	3.7
364	28%	LAMB WESTON HOLDINGS INC	3.7
365	28%	LYONDELLBASELL INDU-CL A	3.7
366	28%	MOHAWK INDUSTRIES INC	3.7
367	27%	NORTHERN TRUST CORP	3.7
368	27%	RESMED INC	3.7
369	27%	UNITED PARCEL SERVICE-CL B	3.7
370	27%	VIACOM INC-CLASS B	3.6
371	27%	AUTOMATIC DATA PROCESSING	3.6
372	26%	COPART INC	3.6
373	26%	M & T BANK CORP	3.6
374	26%	RALPH LAUREN CORP	3.6
375	26%	WESTERN DIGITAL CORP	3.6
376	26%	MCKESSON CORP	3.6
377	25%	TARGET CORP	3.6
378	25%	CINTAS CORP	3.6
379	25%	MOODY'S CORP	3.6
380	25%	KROGER CO	3.6
381	25%	AMERICAN EXPRESS CO	3.6
382	24%	FASTENAL CO	3.6
383	24%	INTEL CORP	3.6
384	24%	COTY INC-CL A	3.6
385	24%	MARSH & MCLENNAN COS	3.6
386	24%	PFIZER INC	3.6
387	23%	HELMERICH & PAYNE	3.6
388	23%	PEPSICO INC	3.6
389	23%	ANSYS INC	3.6
390	23%	AES CORP	3.5
391	23%	IRON MOUNTAIN INC	3.5
392	22%	EVEREST RE GROUP LTD	3.5
393	22%	VARIAN MEDICAL SYSTEMS INC	3.5
394	22%	FIFTH THIRD BANCORP	3.5
395	22%	EXTRA SPACE STORAGE INC	3.5
396	22%	FORTINET INC	3.5
397	21%	REALTY INCOME CORP	3.5
398	21%	KOHLS CORP	3.5
399	21%	BROADRIDGE FINANCIAL SOLUTIONS INC	3.5
400	21%	DUKE ENERGY CORP	3.5

Source: Bloomberg.

Consensus Analyst Recommendation
As of 1/14/19
For S&P 500 Constituents

Rank	Percentile	Company	Analyst Recommendation
401	21%	HEWLETT PACKARD ENTERPRISE	3.5
402	20%	NATIONAL OILWELL VARCO INC	3.5
403	20%	PPL CORP	3.5
404	20%	REPUBLIC SERVICES INC	3.5
405	20%	UNDER ARMOUR INC-CLASS C	3.5
406	20%	ADVANCED MICRO DEVICES	3.5
407	19%	NORDSTROM INC	3.5
408	19%	APARTMENT INVT & MGMT CO -A	3.5
409	19%	CENTURYLINK INC	3.5
410	19%	T ROWE PRICE GROUP INC	3.5
411	19%	WALGREENS BOOTS ALLIANCE INC	3.5
412	18%	C.H. ROBINSON WORLDWIDE INC	3.5
413	18%	HARLEY-DAVIDSON INC	3.5
414	18%	CUMMINS INC	3.4
415	18%	US BANCORP	3.4
416	18%	ABBVIE INC	3.4
417	17%	HENRY SCHEIN INC	3.4
418	17%	MACERICH CO/THE	3.4
419	17%	EQUITY RESIDENTIAL	3.4
420	17%	FREEPORT-MCMORAN INC	3.4
421	17%	H&R BLOCK INC	3.4
422	16%	L BRANDS INC	3.4
423	16%	HOST HOTELS & RESORTS INC	3.4
424	16%	KELLOGG CO	3.4
425	16%	INTL FLAVORS & FRAGRANCES	3.4
426	16%	MATTEL INC	3.4
427	15%	PERKINELMER INC	3.4
428	15%	PINNACLE WEST CAPITAL	3.4
429	15%	PERRIGO CO PLC	3.4
430	15%	XCEL ENERGY INC	3.4
431	15%	INTL BUSINESS MACHINES CORP	3.4
432	14%	TRAVELERS COS INC/THE	3.4
433	14%	UDR INC	3.4
434	14%	CHIPOTLE MEXICAN GRILL INC	3.4
435	14%	JOHNSON CONTROLS INTERNATION	3.4
436	14%	FORD MOTOR CO	3.3
437	13%	KIMCO REALTY CORP	3.3
438	13%	COLGATE-PALMOLIVE CO	3.3
439	13%	HOLLYFRONTIER COPR	3.3
440	13%	PEOPLE'S UNITED FINANCIAL	3.3

Source: Bloomberg.

Consensus Analyst Recommendation
As of 1/14/19
For S&P 500 Constituents

Rank	Percentile	Company	Analyst Recommendation
441	13%	PENTAIR PLC	3.3
442	13%	TWITTER INC	3.3
443	12%	GENERAL MILLS INC	3.3
444	12%	NEWELL BRANDS INC	3.3
445	12%	EXXON MOBIL CORP	3.3
446	12%	MAXIM INTEGRATED PRODUCTS INC	3.3
447	12%	3M CO	3.3
448	11%	PRINCIPAL FINANCIAL GROUP	3.3
449	11%	DTE ENERGY COMPANY	3.3
450	11%	WEC ENERGY GROUP INC	3.3
451	11%	NEWS CORP - CLASS A	3.3
452	11%	BEST BUY CO INC	3.2
453	10%	WHIRLPOOL CORP	3.2
454	10%	F5 NETWORKS INC	3.2
455	10%	PACCAR INC	3.2
456	10%	AFLAC INC	3.1
457	10%	BRIGHTHOUSE FINANCIAL INC	3.1
458	9%	P G & E CORP	3.1
459	9%	CARDINAL HEALTH INC	3.1
460	9%	FLOWSERVE CORP	3.1
461	9%	PULTEGROUP INC	3.1
462	9%	JUNIPER NETWORKS INC	3.1
463	8%	CITRIX SYSTEMS INC	3.1
464	8%	BANK OF NEW YORK MELLON CORP	3.0
465	8%	SEAGATE TECHNOLOGY	3.0
466	8%	SYMANTEC CORP	3.0
467	8%	APACHE CORP	3.0
468	7%	AMEREN CORPORATION	3.0
469	7%	CHURCH & DWIGHT CO INC	3.0
470	7%	GENUINE PARTS CO	3.0
471	7%	GAP INC/THE	3.0
472	7%	HERSHEY CO/THE	3.0
473	6%	JACK HENRY & ASSOCIATES INC	3.0
474	6%	MCCORMICK & CO-NON VTG SHRS	3.0
475	6%	PAYCHEX INC	3.0
476	6%	ROCKWELL AUTOMATION INC	3.0
477	6%	VERISIGN INC	3.0
478	5%	WATERS CORP	3.0
479	5%	UNDER ARMOUR INC-CLASS A	2.9
480	5%	ILLINOIS TOOL WORKS	2.9

Source: Bloomberg.

Consensus Analyst Recommendation
As of 1/14/19
For S&P 500 Constituents

Rank	Percentile	Company	Analyst Recommendation
481	5%	BROWN-FORMAN CORP-CLASS B	2.9
482	5%	MACY'S INC	2.9
483	4%	OMNICOM GROUP	2.9
484	4%	METTLER-TOLEDO INTERNATIONAL	2.9
485	4%	TRIPADVISOR INC	2.9
486	4%	ROBERT HALF INTL INC	2.8
487	4%	UNUM GROUP	2.8
488	3%	WW GRAINGER INC	2.8
489	3%	GARMIN LTD	2.8
490	3%	CLOROX COMPANY	2.8
491	3%	JM SMUCKER CO/THE	2.8
492	3%	CINCINNATI FINANCIAL CORP	2.8
493	2%	VENTAS INC	2.7
494	2%	HORMEL FOODS CORP	2.7
495	2%	EXPEDITORS INTL WASH INC	2.6
496	2%	SOUTHERN CO/THE	2.6
497	2%	WESTERN UNION CO	2.6
498	1%	ALLIANT ENERGY CORP	2.6
499	**1%**	**CONSOLIDATED EDISON INC**	**2.6**
500	1%	PUBLIC STORAGE	2.5
501	1%	KIMBERLY-CLARK CORP	2.5
502	1%	CAMPBELL SOUP CO	2.4
503	0%	TORCHMARK CORP	2.4
504	0%	NEWS CORP - CLASS B	2.0
505	0%	FRANKLIN RESOURCES INC	1.9

Source: Bloomberg.

BENTE VILLADSEN

Principal

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Dr. Bente Villadsen's work concentrates in the areas of regulatory finance and accounting. Her recent work has focused on accounting issues, damages, cost of capital and regulatory finance. Dr. Villadsen has testified on cost of capital and accounting, analyzed credit issues in the utility industry, risk management practices as well the impact of regulatory initiatives such as energy efficiency and de-coupling on cost of capital and earnings. Among her recent advisory work is the review of regulatory practices regarding the return on equity, capital structure, recovery of costs and capital expenditures as well as the precedence for regulatory approval in mergers or acquisitions. Dr. Villadsen's accounting work has pertained to disclosure issues and principles including impairment testing, fair value accounting, leases, accounting for hybrid securities, accounting for equity investments, cash flow estimation as well as overhead allocation. Dr. Villadsen has estimated damages in the U.S. as well as internationally for companies in the construction, telecommunications, energy, cement, and rail road industry. She has filed testimony and testified in federal and state court, in international and U.S. arbitrations and before state and federal regulatory commissions on accounting issues, damages, discount rates and cost of capital for regulated entities.

Dr. Villadsen holds a Ph.D. from Yale University's School of Management with a concentration in accounting. She has a joint degree in mathematics and economics (BS and MS) from University of Aarhus in Denmark. Prior to joining The Brattle Group, Dr. Villadsen was a faculty member at Washington University in St. Louis, University of Michigan, and University of Iowa.

She has taught financial and managerial accounting as well as econometrics, quantitative methods, and economics of information to undergraduate or graduate students. Dr. Villadsen serves as the president of the Society of Utility Regulatory Financial Analysts for 2016-2018.

AREAS OF EXPERTISE

- Regulatory Finance
  - Cost of Capital
  - Cost of Service (including prudence)
  - Energy Efficiency, De-coupling and the Impact on Utilities Financials
  - Relationship between regulation and credit worthiness
  - Risk Management
  - Regulatory Advisory in Mergers & Acquisitions
- Accounting and Corporate Finance
  - Application of Accounting Standards
  - Disclosure Issues
  - Credit Issues in the Utility Industry
- Damages and Valuation (incl. international arbitration)

- Utility valuation
- Lost Profit for construction, oil&gas, utilities
- Valuation of construction contract
- Damages from the choice of inaccurate accounting methdology

EXPERIENCE

Regulatory Finance

- On behalf of the Association of American Railroads, Dr. Villadsen appeared as an expert before the Surface Transportation Board (STB) and submitted expert reports on the determination of the cost of equity for U.S. freight railroads. The STB agreed to continue to use two estimation methods with the parameters suggested.

- For several electric, gas and transmission utilities in Alberta, Canada, Dr. Villadsen filed evidence and appeared as an expert on the cost of equity and appropriate capital structure for 2015-17. Her evidence was heard by the Alberta Utilities Commission.

- Dr. Villadsen has estimated the cost of capital and recommended an appropriate capital structure for natural gas and liquids pipelines in Canada, Mexico, and the US. using the jurisdictions' preferred estimation technique as well as other standard techniques. This work has been used in negotiations with shippers as well as before regulators.

- For the Ontario Energy Board Staff, Dr. Villadsen submitted evidence on the appropriate capital structure for a power generator that is engaged in a nuclear refurbishment program.

- She has estimated the cost of equity on behalf of Anchorage Municipal Light and Power, Arizona Public Service, Portland General Electric, Anchorage Water and Wastewater, American Water, California Water, and EPCOR in state regulatory proceedings. She has also submitted testimony before the Bonneville Power Authority. Much of her testimony involves not only cost of capital estimation but also capital structure, the impact on credit metrics and various regulatory mechanisms such as revenue stabilization, riders and trackers.

- In Australia, she has submitted led and co-authored a report on cost of equity and debt estimation methods for the Australian Pipeline Industry Association. The equity report was filed with the Australian Energy Regulator as part of the APIA's response to the Australian Energy Regulator's development of rate of return guidelines and both reports were filed with the Economic Regulation Authority by the Dampier Bunbury Pipeline. She has also submitted a report on aspects of the WACC calculation for Aurizon Network to the Queensland Competition Authority.

- In Canada, Dr. Villadsen has co-authored reports for the British Columbia Utilities Commission and the Canadian Transportation Agency regarding cost of capital methodologies. Her work consisted partly of summarizing and evaluating the pros and cons of methods and partly of surveying Canadian and world-wide practices regarding cost of capital estimation.
- Dr. Villadsen worked with utilities to estimate the magnitude of the financial risk inherent in long-term gas contracts. In doing so, she relied on the rating agency of Standard & Poor's published methodology for determining the risk when measuring credit ratios.
- She has worked on behalf of infrastructure funds, pension funds, utilities and others on understanding and evaluating the regulatory environment in which electric, natural gas, or water utilities operate for the purpose of enhancing investors ability to understand potential investments. She has also provided advise and testimony in the approval phase of acquisitions.
- On behalf of utilities that are providers of last resort, she has provided estimates of the proper compensation for providing the state-mandated services to wholesale generators.
- In connection with the AWC Companies application to construct a backbone electric transmission project off the Mid-Atlantic Coast, Dr. Villadsen submitted testimony before the Federal Energy Regulatory Commission on the treatment the accounting and regulatory treatment of regulatory assets, pre-construction costs, construction work in progress, and capitalization issues.
- On behalf of ITC Holdings, she filed testimony with the Federal Energy Regulatory Commission regarding capital structure issues.
- Testimony on the impact of transaction specific changes to pension plans and other rate base issues on behalf of Balfour Beatty Infrastructure Partners before the Michigan Public Service Commission.
- On behalf of financial institutions, Dr. Villadsen has led several teams that provided regulatory guidance regarding state, provincial or federal regulatory issues for integrated electric utilities, transmission assets and generation facilities. The work was requested in connection with the institutions evaluation of potential investments.
- For a natural gas utility facing concerns over mark to market losses on long term gas hedges, Dr. Villadsen helped develop a program for basing a portion of hedge targets on trends in market volatility rather than on just price movements and volume goals. The approach was

refined and approved in a series of workshops involving the utility, the state regulatory staff, and active intervener groups. These workshops evolved into a forum for quarterly updates on market trends and hedging positions.

- She has advised the private equity arm of three large financial institutions as well as two infrastructure companies, a sovereign fund and pension fund in connection with their acquisition of regulated transmission, distribution or integrated electric assets in the U.S. and Canada. For these clients, Dr. Villadsen evaluated the regulatory climate and the treatment of acquisition specific changes affecting the regulated entity, capital expenditures, specific cost items and the impact of regulatory initiatives such as the FERC's incentive return or specific states' approaches to the recovery of capital expenditures riders and trackers. She has also reviewed the assumptions or worked directly with the acquirer's financial model.
- On behalf of a provider of electric power to a larger industrial company, Dr. Villadsen assisted in the evaluation of the credit terms and regulatory provisions for the long-term power contract.
- For several large electric utility, Dr. Villadsen reviewed the hedging strategies for electricity and gas and modeled the risk mitigation of hedges entered into. She also studies the prevalence and merits of using swaps to hedge gas costs. This work was used in connection with prudence reviews of hedging costs in Colorado, Oregon, Utah, West Virginia, and Wyoming.
- She estimated the cost of capital for major U.S. and Canadian utilities, pipelines, and railroads. The work has been used in connection with the companies' rate hearings before the Federal Energy Regulatory Commission, the Canadian National Energy Board, the Surface Transportation Board, and state and provincial regulatory bodies. The work has been performed for pipelines, integrated electric utilities, non-integrated electric utilities, gas distribution companies, water utilities, railroads and other parties. For the owner of Heathrow and Gatwick Airport facilities, she has assisted in estimating the cost of capital of U.K. based airports. The resulting report was filed with the U.K. Competition Commission.
- For a Canadian pipeline, Dr. Villadsen co-authored an expert report regarding the cost of equity capital and the magnitude of asset retirement obligations. This work was used in arbitration between the pipeline owner and its shippers.
- In a matter pertaining to regulatory cost allocation, Dr. Villadsen assisted counsel in collecting necessary internal documents, reviewing internal accounting records and using this information to assess the reasonableness of the cost allocation.

- She has been engaged to estimate the cost of capital or appropriate discount rate to apply to segments of operations such as the power production segment for utilities.
- In connection with rate hearings for electric utilities, Dr. Villadsen has estimated the impact of power purchase agreements on the company's credit ratings and calculated appropriate compensation for utilities that sign such agreements to fulfill, for example, renewable energy requirements.
- Dr. Villadsen has been part of a team assessing the impact of conservation initiatives, energy efficiency, and decoupling of volumes and revenues on electric utilities financial performance. Specifically, she has estimated the impact of specific regulatory proposals on the affected utilities earnings and cash flow.
- On behalf of Progress Energy, she evaluated the impact of a depreciation proposal on an electric utility's financial metric and also investigated the accounting and regulatory precedent for the proposal.
- For a large integrated utility in the U.S., Dr. Villadsen has for several years participated in a large range of issues regarding the company's rate filing, including the company's cost of capital, incentive based rates, fuel adjustment clauses, and regulatory accounting issues pertaining to depreciation, pensions, and compensation.
- Dr. Villadsen has been involved in several projects evaluating the impact of credit ratings on electric utilities. She was part of a team evaluating the impact of accounting fraud on an energy company's credit rating and assessing the company's credit rating but-for the accounting fraud.
- For a large electric utility, Dr. Villadsen modeled cash flows and analyzed its financing decisions to determine the degree to which the company was in financial distress as a consequence of long-term energy contracts.
- For a large electric utility without generation assets, Dr. Villadsen assisted in the assessment of the risk added from offering its customers a price protection plan and being the provider of last resort (POLR).
- For several infrastructure companies, Dr. Villadsen has provided advice regarding the regulatory issues such as the allowed return on equity, capital structure, the determination of rate base and revenue requirement, the recovery of pension, capital expenditure, fuel, and other costs as well as the ability to earn the allowed return on equity. Her work has spanned

12 U.S. states as well as Canada, Europe, and South America. She has been involved in the electric, natural gas, water, and toll road industry.

Accounting and Corporate Finance

- On behalf of a construction company in arbitration with a sovereign, Dr. Villadsen filed an expert report report quantifying damages in the form of lost profit and consequential damages.
- In arbitration before the International Chamber of Commerce Dr. Villadsen testified regarding the true-up clauses in a sales and purchase agreement, she testified on the distinction between accruals and cash flow measures as well as on the measurement of specific expenses and cash flows.
- On behalf of a taxpayer, Dr. Villadsen recently testified in federal court on the impact of discount rates on the economic value of alternative scenarios in a lease transaction.
- In an arbitration matter before the International Centre for Settlement of Investment Disputes, she provided expert reports and oral testimony on the allocation of corporate overhead costs and damages in the form of lost profit. Dr. Villadsen also reviewed internal book keeping records to assess how various inter-company transactions were handled.
- Dr. Villadsen provided expert reports and testimony in an international arbitration under the International Chamber of Commerce on the proper application of US GAAP in determining shareholders' equity. Among other accounting issues, she testified on impairment of long-lived assets, lease accounting, the equity method of accounting, and the measurement of investing activities.
- In a proceeding before the International Chamber of Commerce, she provided expert testimony on the interpretation of certain accounting terms related to the distinction of accruals and cash flow.
- In an arbitration before the American Arbitration Association, she provided expert reports on the equity method of accounting, the classification of debt versus equity and the distinction between categories of liabilities in a contract dispute between two major oil companies. For the purpose of determining whether the classification was appropriate, Dr. Villadsen had to review the company's internal book keeping records.

- In U.S. District Court, Dr. Villadsen filed testimony regarding the information required to determine accounting income losses associated with a breach of contract and cash flow modeling.
- Dr. Villadsen recently assisted counsel in a litigation matter regarding the determination of fair values of financial assets, where there was a limited market for comparable assets. She researched how the designation of these assets to levels under the FASB guidelines affect the value investors assign to these assets.
- She has worked extensively on litigation matters involving the proper application of mark-to-market and derivative accounting in the energy industry. The work relates to the proper valuation of energy contracts, the application of accounting principles, and disclosure requirements regarding derivatives.
- Dr. Villadsen evaluated the accounting practices of a mortgage lender and the mortgage industry to assess the information available to the market and ESOP plan administrators prior to the company's filing for bankruptcy. A large part of the work consisted of comparing the company's and the industry's implementation of gain-of-sale accounting.
- In a confidential retention matter, Dr. Villadsen assisted attorneys for the FDIC evaluate the books for a financial investment institution that had acquired substantial Mortgage Backed Securities. The dispute evolved around the degree to which the financial institution had impaired the assets due to possible put backs and the magnitude and estimation of the financial institution's contingencies at the time of it acquired the securities.
- In connection with a securities litigation matter she provided expert consulting support and litigation consulting on forensic accounting. Specifically, she reviewed internal documents, financial disclosure and audit workpapers to determine (1) how the balance's sheets trading assets had been valued, (2) whether the valuation was following GAAP, (3) was properly documented, (4) was recorded consistently internally and externally, and (5) whether the auditor had looked at and documented the valuation was in accordance with GAAP.
- In a securities fraud matter, Dr. Villadsen evaluated a company's revenue recognition methods and other accounting issues related to allegations of improper treatment of non-cash trades and round trip trades.
- For a multi-national corporation with divisions in several countries and industries, Dr. Villadsen estimated the appropriate discount rate to value the divisions. She also assisted the

company in determining the proper manner in which to allocate capital to the various divisions, when the company faced capital constraints.

- Dr. Villadsen evaluated the performance of segments of regulated entities. She also reviewed and evaluated the methods used for overhead allocation.
- She has worked on accounting issues in connection with several tax matters. The focus of her work has been the application of accounting principles to evaluate intra-company transactions, the accounting treatment of security sales, and the classification of debt and equity instruments.
- For a large integrated oil company, Dr. Villadsen estimated the company's cost of capital and assisted in the analysis of the company's accounting and market performance.
- In connection with a bankruptcy proceeding, Dr. Villadsen provided litigation support for attorneys and an expert regarding corporate governance.

Damages and Valuation

- For the Alaska Industrial Development and Export Authority, Dr. Villadsen co-authored a report that estimated the range of recent acquisition and trading multiples for natural gas utilities.
- On behalf of a taxpayer, Dr. Villadsen testified on the economic value of alternative scenarios in a lease transaction regarding infrastructure assets.
- For a foreign construction company involved in an international arbitration, she estimated the damages in the form of lost profit on the breach of a contract between a sovereign state and a construction company. As part of her analysis, Dr. Villadsen relied on statistical analyses of cost structures and assessed the impact of delays.
- In an international arbitration, Dr. Villadsen estimated the damages to a telecommunication equipment company from misrepresentation regarding the product quality and accounting performance of an acquired company. She also evaluated the IPO market during the period to assess the possibility of the merged company to undertake a successful IPO.

- On behalf of pension plan participants, Dr. Villadsen used an event study estimated the stock price drop of a company that had engaged in accounting fraud. Her testimony conducted an event study to assess the impact of news regarding the accounting misstatements.

- In connection with a FINRA arbitration matter, Dr. Villadsen estimated the value of a portfolio of warrants and options in the energy sector and provided support to counsel on finance and accounting issues.

- She assisted in the estimation of net worth of individual segments for firms in the consumer product industry. Further, she built a model to analyze the segment's vulnerability to additional fixed costs and its risk of bankruptcy.

- Dr. Villadsen was part of a team estimating the damages that may have been caused by a flawed assumption in the determination of the fair value of mortgage related instruments. She provided litigation support to the testifying expert and attorneys.

- For an electric utility, Dr. Villadsen estimated the loss in firm value from the breach of a power purchase contract during the height of the Western electric power crisis. As part of the assignment, Dr. Villadsen evaluated the creditworthiness of the utility before and after the breach of contract.

- Dr. Villadsen modeled the cash flows of several companies with and without specific power contract to estimate the impact on cash flow and ultimately the creditworthiness and value of the utilities in question.

BOOKS

"*Risk and Return for Regulated Industries*," (with Michael J. Vilbert, Dan Harris, and A. Lawrence Kolbe) Elsevier, May 2017.

PUBLICATIONS AND REPORTS

"Impact of New Tax Law on Utilities' Deferred Taxes," (with Mike Tolleth and Elliott Metzler), *CRRI 37'th Annual Eastern Conference*, June, 2018.

"Implications of the New Tax Law for Regulated Utilities," The Brattle Group, January 2018.

"Using Electric and Gas Forwards to Manage Market Risks: When a power purchase agreement with a utility is not possible, standard forward contracts can act as viable hedging instruments*," North American Windpower*, May 2017, pp. 34-37.

"*Managing Price Risk for Merchant Renewable Investments: Role of Market Interactions and Dynamics on Effective Hedging Strategies*," (with Onur Aydin and Frank Graves), Brattle Whitepaper, January 2017.

"Aurizon Network 2016 Access Undertaking: Aspects of the WACC," (with Mike Tolleth), filed with the *Queensland Competition Authority*, Australia, November 2016.

"Report on Gas LDC multiples," with Michael J. Vilbert, *Alaska Industrial Development and Export Authority*, May 2015.

"Aurizon Network 2014 Draft Access Undertaking: Comments on Aspects of the WACC," prepared for Aurizon Network and submitted to the *Queensland Competition Authority*, December 2014

"Brattle Review of AE Planning Methods and Austin Task Force Report." (with Frank C. Graves) September 24, 2014.

Report on "Cost of Capital for Telecom Italia's Regulated Business" with Stewart C. Myers and Francesco Lo Passo before the *Communications Regulatory Authority of Italy* ("AGCOM"), March 2014. *Submitted in Italian.*

"Alternative Regulation and Ratemaking Approaches for Water Companies: Supporting the Capital Investment Needs of the 21st Century," (with J. Wharton and H. Bishop), prepared for the *National Association of Water Companies*, October 2013.

"Estimating the Cost of Debt," (with T. Brown), prepared for the Dampier Bunbury Pipeline and filed with the *Economic Regulation Authority*, Western Australia, March 2013.

"Estimating the Cost of Equity for Regulated Companies," (with P.R. Carpenter, M.J. Vilbert, T. Brown, and P. Kumar), prepared for the Australian Pipeline Industry Association and filed with the *Australian Energy Regulator* and the *Economic Regulation Authority*, Western Australia, February 2013.

"Calculating the Equity Risk Premium and the Risk Free Rate," (with Dan Harris and Francesco LoPasso), prepared for *NMa and Opta, the Netherlands*, November 2012.

"Shale Gas and Pipeline Risk: Earnings Erosion in a More Competitive World," (with Paul R. Carpenter, A. Lawrence Kolbe, and Steven H. Levine), *Public Utilities Fortnightly*, April 2012.

"Survey of Cost of Capital Practices in Canada," (with Michael J. Vilbert and Toby Brown), prepared for *British Columbia Utilities Commission*, May 2012.

"Public Sector Discount Rates" (with rank Graves, Bin Zhou), *Brattle* white paper, September 2011

"FASB Accounting Rules and Implications for Natural Gas Purchase Agreements," (with Fiona Wang), *American Clean Skies Foundation*, February 2011.

"IFRS and You: How the New Standards Affect Utility Balance Sheets," (with Amit Koshal and Wyatt Toolson), *Public Utilities Fortnightly*, December 2010.

"Corporate Pension Plans: New Developments and Litigation," (with George Oldfield and Urvashi Malhotra), Finance Newsletter, Issue 01, *The Brattle Group*, November 2010.

"Review of Regulatory Cost of Capital Methodologies," (with Michael J. Vilbert and Matthew Aharonian), *Canadian Transportation Agency*, September 2010.

"Building Sustainable Efficiency Businesses: Evaluating Business Models," (with Joe Wharton and Peter Fox-Penner), *Edison Electric Institute*, August 2008.

"Understanding Debt Imputation Issues," (with Michael J. Vilbert and Joe Wharton and *The Brattle Group* listed as an author), *Edison Electric Institute*, June 2008.

"Measuring Return on Equity Correctly: Why current estimation models set allowed ROE too low," *Public Utilities Fortnightly*, August 2005 (with A. Lawrence Kolbe and Michael J. Vilbert).

"The Effect of Debt on the Cost of Equity in a Regulatory Setting," (with A. Lawrence Kolbe and Michael J. Vilbert, and with "*The Brattle Group*" listed as author), *Edison Electric Institute,* April 2005.

"Communication and Delegation in Collusive Agencies," *Journal of Accounting and Economics*, Vol. 19, 1995.

"Beta Distributed Market Shares in a Spatial Model with an Application to the Market for Audit Services" (with M. Hviid), *Review of Industrial Organization*, Vol. 10, 1995.

SELECTED PRESENTATIONS

"Lessons from the U.S. and Australia" presented at *Seminar on the Cost of Capital in Regulated Industries: Time for a Fresh Perspective?* Brussels, October 2017.

"Should Regulated Utilities Hedge Fuel Cost and if so, How?" presented at *SURFA's 49 Financial Forum*, April 20-21, 2017.

"Transmission: The Interplay Between FERC Rate Setting at the Wholesale Level and Allocation to Retail Customers," (with Mariko Geronimo Aydin) presented at *Law Seminars International: Electric Utility Rate Cases*, March 16-17, 2017.

"Capital Structure and Liability Management," *American Gas Association and Edison Electric Institute Public Utility Accounting Course*, August 2015-2017.

"Current Issues in Cost of Capital," *Edison Electric Institute Advanced Rate School*, July 2013-2017.

"Alternative Regulation and Rate Making Approaches for Water Companies," *Society of Depreciation Professionals Annual Conference*, September 2014.

"Capital Investments and Alternative Regulation," *National Association of Water Companies Annual Policy Forum*, December 2013.

"Accounting for Power Plant," *SNL's Inside Utility Accounting Seminar*, Charlotte, NC, October 2012.

"GAAP / IFRS Convergence," *SNL's Inside Utility Accounting Seminar*, Charlotte, NC, October 2012.

"International Innovations in Rate of Return Determination," *Society of Utility Financial and Regulatory Analysts' Financial Forum*, April 2012.

"Utility Accounting and Financial Analysis: The Impact of Regulatory Initiatives on Accounting and Credit Metrics," 1.5 day seminar, EUCI, Atlanta, May 2012.

"Cost of Capital Working Group Eforum," *Edison Electric Institute webinar*, April 2012.

"Issues Facing the Global Water Utility Industry" Presented to Sensus' Executive Retreat, Raleigh, NC, July 2010.

"Regulatory Issues from GAAP to IFRS," NASUCA *2009 Annual Meeting*, Chicago, November 2009.

"Subprime Mortgage-Related Litigation: What to Look for and Where to Look," *Law Seminars International: Damages in Securities Litigation*, Boston, May 2008.

"Evaluating Alternative Business / Inventive Models," (with Joe Wharton). *EEI Workshop, Making a Business of Energy Efficiency: Sustainable Business Models for Utilities*, Washington DC, December 2007.

"Deferred Income Taxes and IRS's NOPR: Who should benefit?" *NASUCA Annual Meeting*, Anaheim, CA, November 2007.

"Discussion of 'Are Performance Measures Other Than Price Important to CEO Incentives?'" *Annual Meeting of the American Accounting Association*, 2000.

"Contracting and Income Smoothing in an Infinite Agency Model: A Computational Approach," (with R.T. Boylan) *Business and Management Assurance Services Conference*, Austin 2000.

TESTIMONY

Direct Testimony on cost of capital and capital structure for Northwest Natural Gas Company submitted to the Washington Utilities and Transportation Commission, Docket No. 181053, December 2018.

Pre-filed Direct Testimony on cost of capital and capital structure for Anchorage Water Utility and Anchorage Wastewater Utility submitted to the *Regulatory Commission of Alaska*, TA163-122 and TA164-126, December 2018.

Direct Testimony on cost of capital for Portland General Electric Company submitted to the *Oregon Public Utility Commission* on behalf of Portland General Electric Company (with Hager and Liddle), EU 335, February 2018.

Direct Testimony and Rebuttal Testimony on cost of capital for NW Natural submitted to the *Oregon Public Utility Commission* on behalf of NW Natural, UG 344, December 2017, May 2018.

Direct Pre-filed Testimony and Reply Pre-filed Testimony on cost of equity and capital structure for Anchorage Water and Wastewater Utilities before the *Regulatory Commission of Alaska*, TA161-122 and TA162-126, November 2017, September 2018.

Direct Testimony, Rebuttal Testimony, deposition, and hearing appearance on wholesale water rates for Petitioner Cities, *Texas Public Utility Commission*, PUC Docket 46662, SOAH Docket 473-17-4964.WS, November 2017, January, June, July, October 2018.

Affidavit on Lifting the Dividend Restriction for Anchorage Water Utility for AWWU, *Regulatory Commission of Alaska*, U-17-095, November 2017.

Written Evidence, Rebuttal Evidence and Hearing appearance on the Cost of Capital and Capital Structure for the ATCO Utilities and AUI, 2018-2020 Generic Cost of Capital Proceeding, *Alberta Utilities Commission*, October 2017, February – March 2018.

Written Evidence, Rebuttal Evidence, and Hearing Appearance on Regulatory Tax Treatment for the ATCO Utilities and AUI, 201802020 Generic Cost of Capital Proceeding, *Alberta Utilities Commission*, October 2017, February – March 2018.

Affidavit on the Creation of a Regulatory Assets for PRV Rebates for Anchorage Water Utility, submitted to the *Regulatory Commission of Alaska*, U-17-083, August 2017.

Direct and Rebuttal Testimony, Hearing Appearance on Cost of Capital for California-American Water Company for California-American Water submitted to the *California Public Utilities Commission*, Application 17-04-003, April, August, September 2017.

Direct, Rebuttal, Surrebuttal, Supplemental, Supplemental Rebuttal Testimony and Hearing Appearance on the Cost of Capital for Northern Illinois Gas Company submitted to the *Illinois Commerce Commission*, GRM #17-055, March, July, August, September, and November 2017.

Direct and Rebuttal Testimony on Cost of Capital for Portland General Electric Company submitted to the *Oregon Public Utility Commission* on behalf of Portland General Electric Company, Docket No. UE 319, February, July 2017.

Pre-filed Direct and Reply Testimony and Hearing Appearance on Cost of Equity and Capital Structure for Anchorage Municipal Light and Power, *Regulatory Commission of Alaska*, Docket No. TA357-121, December 2016, August and December 2017.

Expert report and Hearing Appearance regarding the Common Equity Ratio for OPG's Regulated Generation for OEB Staff, *Ontario Energy Board*, EB-2016-0152, November 2016, April 2017.

Pre-filed Direct Testimony on Cost of Equity and Capital Structure for Anchorage Municipal Wastewater Utility, *Regulatory Commission of Alaska*, Docket No. 158-126, November 2016.

Expert Report and Reply Expert Report on damages (quantum) in exit arbitration (with Dan Harris), *International Center for the Settlement of Investment Disputes*, October 2016, October 2018.

Direct Testimony on capital structure, embedded cost of debt, and income taxes for Detroit Thermal, Michigan Public Service Commission, Docket No. UE-18131, July 2016.

Direct Testimony on return on equity for Arizona Public Service Company, Arizona Corporation Commission, Docket E-01345A-16-0036, June 2016.

Written evidence, rebuttal evidence and hearing appearance regarding the cost of equity and capital structure for Alberta-based utilities, the Alberta Utilities Commission, Proceeding No. 20622 on behalf of AltaGas Utilities Inc., ENMAX Power Corporation, FortisAlberta Inc., and The ATCO Utilities, February, May and June 2016.

Verified Statement, Verified Reply Statement, and Hearing Appearance regarding the cost of capital methodology to be applied to freight railroads, the *Surface Transportation Board* on behalf of the Association of American Railroads, Docket No. EP 664 (Sub-No. 2), July 2015, September and November 2015.

Direct Testimony on cost of capital submitted to the Oregon Public Utility Commission on behalf of Portland General Electric, Docket No. UE 294, February 2015.

Supplemental Direct Testimony and Reply Testimony on cost of capital submitted to the *Regulatory Commission of Alaska* on behalf of Anchorage Water and Wastewater utilities, Docket U-13-202, September 2014, March 2015.

Expert Report and hearing appearance on specific accrual and cash flow items in a Sales and Purchase Agreement in international arbitration before the *International Chamber of Commerce*. Case No. 19651/TO, July and November 2014. (*Confidential*)

Rebuttal Testimony regarding Cost of Capital before the *Oregon Public Utility Commission* on behalf of Portland General Electric, Docket No. UE 283, July 2014.

Direct Testimony on the rate impact of the pension re-allocation and other items for Upper Peninsula Power Company in connection with the acquisition by BBIP before the *Michigan Public Service Commission* in Docket No. U-17564, March 2014.

Expert Report on cost of equity, non-recovery of operating cost and asset retirement obligations on behalf of oil pipeline in arbitration, April 2013. (*Confidential*)

Direct Testimony on the treatment of goodwill before the *Federal Energy Regulatory Commission* on behalf of ITC Holdings Corp and ITC Midwest, LLC in Docket No. PA10-13-000, February 2012.

Direct and Rebuttal Testimony on cost of capital before the *Public Utilities Commission of the State of California* on behalf of California-American Water in Application No. 11-05, May 2011.

Direct Testimony, Rebuttal Testimony, and Hearing Appearance on cost of capital before the *New Mexico Public Regulation Commission* on behalf of New Mexico-American Water in Case No. 11-00196-UT, May 2011, November 2011, and December 2011.

Direct Testimony on regulatory assets and FERC accounting before the *Federal Energy Regulatory Commission* on behalf of AWC Companies, EL11-13-000, December 2010.

Expert Report and deposition in Civil Action No. 02-618 (GK/JMF) in the *United States District Court for the District of Columbia*, November 2010, January 2011. (*Confidential*)

Direct Testimony, Rebuttal Testimony, and Rejoinder Testimony on the cost of capital before the *Arizona Corporation Commission* on behalf of Arizona-American Water in Docket No. W-01303A-10-0448, November 2010, July 2011, and August 2011.

Direct Testimony on the cost of capital before *the New Mexico Public Regulation Commission* on behalf of New Mexico-American Water in Docket No. 09-00156-UT, August 2009.

Direct and Rebuttal Testimony and Hearing Appearance on the cost of capital before the *Arizona Corporation Commission* on behalf of Arizona-American Water in Docket No. W-01303A-09-0343, July 2009, March 2010 and April 2010.

Rebuttal Expert Report, Deposition and Oral Testimony re. the impact of alternative discount rate assumptions in tax litigation. *United States Court of Federal Claims*, Case No. 06-628 T, January, February, April 2009. (*Confidential*)

Direct Testimony, Rebuttal Testimony and Hearing Appearance on cost of capital before the *New Mexico Public Regulation Commission* on behalf of New Mexico-American Water in Docket No. 08-00134-UT, June 2008 and January 2009.

Direct Testimony on cost of capital and carrying charge on damages, U.S. Department of Energy, *Bonneville Power Administration*, BPA Docket No. WP-07, March 2008.

Direct Testimony, Rebuttal Testimony, Rejoinder Testimony and Hearing Appearance on cost of capital before the *Arizona Corporation Commission* on behalf of Arizona-American Water in Docket No. W-01303A-08-0227, April 2008, February 2009, March 2009.

Expert Report, Supplemental Expert Report, and Hearing Appearance on the allocation of corporate overhead and damages from lost profit. *The International Centre for the Settlement of Investment Disputes*, Case No. ARB/03/29, February, April, and June 2008 (*Confidential*).

Expert Report on accounting information needed to assess income. *United States District Court* for the District of Maryland (Baltimore Division), Civil No. 1:06cv02046-JFM, June 2007 (*Confidential*)

Expert Report, Rebuttal Expert Report, and Hearing Appearance regarding investing activities, impairment of assets, leases, shareholder' equity under U.S. GAAP and valuation. *International Chamber of Commerce* (ICC), Case No. 14144/CCO, May 2007, August 2007, September 2007. (Joint with Carlos Lapuerta, *Confidential*)

Direct Testimony, Rebuttal Testimony, and Hearing Appearance on cost of capital before the *Arizona Corporation Commission* on behalf of Arizona-American Water in Docket No. W-01303A-06-0491, July 2006, July 2007.

Direct Testimony, Rebuttal Testimony, Rejoinder Testimony, Supplemental Rejoinder Testimony and Hearing Appearance on cost of capital before the *Arizona Corporation Commission* on behalf of Arizona-American Water in Docket No. W-01303A-06-0403, June 2006, April 2007, May 2007.

Direct Testimony, Rebuttal Testimony, Rejoinder Testimony, and Hearing Appearance on cost of capital before *the Arizona Corporation Commission* on behalf of Arizona-American Water in Docket No. W-01303A-06-0014, January 2006, October 2006, November 2006.

Expert report, rebuttal expert report, and deposition on behalf of a major oil company regarding the equity method of accounting and classification of debt and equity, *American Arbitration Association*, August 2004 and November 2004. (*Confidential*).

Technical Appendix to the Direct Testimony of Bente Villadsen

This technical appendix contains methodological details related to my implementations of the DCF and CAPM / ECAPM models. It also contains a discussion of both the basic finance principles and the specific standard formulations of the financial leverage adjustments employed to determine the cost of equity for a company with the level of financial risk inherent in Con Edison's requested regulatory capital structure.

Table of Contents

I. DCF Models

A. DCF Estimation of Cost of Equity

The DCF method for estimating the cost of equity capital assumes that the market price of a stock is equal to the present value of the dividends that its owners expect to receive. The method also assumes that this present value can be calculated by the standard formula for the present value of a cash flow stream:

$$P_0 = \frac{D_1}{1+r} + \frac{D_2}{(1+r)^2} + \frac{D_3}{(1+r)^3} + \cdots + \frac{D_T}{(1+r)^T} \tag{1}$$

where P_0 is the current market price of the stock; D_t is the dividend cash flow expected at the end of period t; r is the cost of equity capital; and T is the last period in which a dividend cash flow is to be received. The formula simply says that the stock price is equal to the sum of the expected future dividends, each discounted for the time and risk between now and the time the dividend is expected to be received. Since the current market price is known, it is possible to infer the cost of equity that corresponds to that price and a forecasted pattern of expected future dividends. In terms of Equation (1), if P_0 is known and $D_1, D_2, \ldots D_T$ are estimated, an analyst can "solve for" the cost of equity capital r.

B. Details of the DCF Model

Perhaps the most widely known and used application of the DCF method assumes that the expected rate of dividend growth remains constant forever. In the so-called Gordon Growth Model, the relationship expressed in Equation (1) is such that the present value equation can be rearranged algebraically into a formula for estimating the cost of equity. Specifically, if investors expect a dividend stream that will grow forever at a steady rate, then the market price of the stock will be given by

$$P_0 = \frac{D_1}{r-g} \tag{2}$$

where D_1 is the dividend expected at the end of the first period, g is the perpetual growth rate, and P_0 and r are the market price and the cost of capital, as before. Equation (2) is a simplified version of Equation (1) that can be solved algebraically to yield the well-known "DCF formula" for the cost of equity capital,

$$r = \frac{D_1}{P_0} + g = \frac{D_0 \times (1 + g)}{P_0} + g \tag{3}$$

There are other versions of the DCF model that relax this restrictive assumption and posit a more complex or nuanced pattern of expected future dividend payments. For example, if there is reason to believe that investors do *not* expect a company's dividends to grow at a steady rate forever, but rather have different growth rate expectations in the near term (e.g., over the next five or ten years), compared to the distant future (e.g., a period *starting* ten years from the present moment), a "multi-stage" growth pattern can be modeled in the present value formula (Equation (1)).

1. Dividends, Cash Flows, and Share Repurchases

In addition to the DCF model described above, there are many alternative formulations. Notable among these are versions of the model that use cash flows rather than dividends in the present value formula (Equation (1)).[1]

Because investors are interested in cash flow, it is technically important to capture *all* cash flows that are distributed to shareholders when estimating the cost of equity using the DCF method. In some circumstances, investors may expect to receive cash in forms other than dividends. An important example concerns the fact that many companies distribute cash to shareholders through share buybacks in addition to dividends. To the extent such repurchases are expected by investors, but not captured in the forecasted pattern of future dividends; a dividend-based implementation of the DCF model will <u>underestimate</u> the cost of equity.

Similarly, if investors have reason to suspect that a company's dividend payments will not reflect a full distribution of its available cash free cash flows in the period they were generated, it may be appropriate replace the forecasted dividends with estimated free cash flows to equity in the present value formula (Equation (1)). Focusing on *available* cash rather than that actually distributed in the form of dividends can help account for instances when near-term investing and financing activities (e.g., capital expenditures or asset sales, debt issuances or retirements, or share repurchases) may cause dividend growth patterns to diverge from growth in earnings.

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[1] For an example in a regulatory context, the U.S. Surface Transportation Board uses a cash flow based model with three stages to estimate the cost of equity for the railroads. See Surface Transportation Board Decision, "STB Ex Parte No. 664 (Sub-No. 1)," Decided January 23, 2009. Confirmed in EP-664 (Sub-No. 2), October 31, 2016.

Many utility companies such as those included in my proxy group have long histories of paying a dividend. In fact, as mentioned in Section I of this Appendix, one of my standard requirements for inclusion in my proxy group is that a company pays dividends for 5-years without a gap or a dividend cut (on per share basis). Additionally, although some utility companies have engaged in share repurchase programs, the companies in my proxy group do not distribute substantial cash flows by means other than dividends.[2]

C. DCF Model Inputs

1. Dividends and Prices

As described above, DCF models are forward-looking, comparing the *current* price of a stock to its expected *future* dividends to estimate the required expected return demanded by the market for that stock (i.e., the cost of equity). Therefore, the models demand the current market price and currently prevailing forecasts of future dividends as inputs.

The stock price input I employ for each proxy group company is the average of the closing stock prices for the 15 trading days ending on the date of my analysis. This guards against biases that may arise on a single trading day, yet is consistent with using current stock prices.

2. Company Specific Growth Rates

a. Analysts' Forecasted Growth Rates

Finding the right growth rate(s) is usually the "hard part" of applying the DCF model, which is sometimes criticized due to what has been called "optimism bias" in the earnings growth rate forecasts of security analysts. Optimism bias is defined as tendency for analysts to forecast earnings growth rates that are higher than are actually achieved. Any optimism bias might be related to incentives faced by analysts that provide rewards not strictly based upon the accuracy of the forecasts. To the extent optimism bias is present in the analysts' earnings forecasts the cost of capital estimates from the DCF model would be too high.

While academic researchers during the 1990s as well as in early 2000s found evidence of analysts' optimism bias, there is some evidence that regulatory reforms have eliminated the

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[2] While a number of companies in my proxy group have or have had share repurchase programs, the magnitude tends to be relatively small, so that an inclusion of the cash flow from repurchases would likely have a minimal impact on the average results for the proxy group. However, it is clear that not including the cash distributions from such repurchases downwardly biases the estimated cost of equity.

issue. A more recent paper by Hovakimina and Saenyasiri (2010) found that recent efforts to curb analysts' incentive to provide optimistic forecasts have worked, so that "the median forecast bias essentially disappeared."[3] Thus, some recent research indicates that the analyst bias may be a problem of the past.

The findings of several academic studies[4] show that analyst earnings forecasts turn out to be too optimistic for stocks that are more difficult to value, for instance, stocks of smaller firms, firms with high volatility or turnover, younger firms, or firms whose prospects are uncertain. Coincidentally, stocks with greater analyst disagreement have higher analyst optimism bias—all of these describe companies that are more volatile and/or less transparent—none of which is applicable to the majority of utility companies with wide analyst coverage and information transparency. Consequently, optimism bias is not expected to be an issue for utilities.

b. Sources for Forecasted Growth Rates

For the reasons described above, I rely on analyst forecasts of earnings growth for the company-specific growth rate inputs to my implementations of the single- and multi-stage DCF models. Most companies in my proxy group have coverage from equity analysts reporting to Thomson Reuters IBES, so I use the consensus 3-5 year EPS growth rate provided by that service. I supplement these consensus values with growth rates based on EPS estimates from *Value Line*.[5]

II. CAPM and ECAPM

A. The Capital Asset Pricing Model (CAPM)

The Capital Asset Pricing Model (CAPM) is a theoretical model stating that the collective investment decisions of investors in capital markets will result in equilibrium prices for all risky

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3 A. Hovakimian and E. Saenyasiri, "Conflicts of Interest and Analyst Behavior: Evidence from Recent Changes in Regulation," *Financial Analysts Journal*, vol. 66, 2010.

4 These studies include the following: (i) Hribar, P, McInnis, J. "Investor Sentiment and Analysts' Earnings Forecast Errors," *Management Science* Vol. 58, No. 2 (February 2012): pp. 293-307; (ii) Scherbina, A. (2004), "Analyst Disagreement, Forecast Bias and Stock Returns," downloaded from Harvard Business School Working Knowledge: http://hbswk.hbs.edu/item/5418.html; and (iii) Michel, J-S., Pandes J.A. (2012), "Are Analysts Really Too Optimistic?" downloaded from http://www.efmaefm.org.

5 Specifically, I compute the growth rate implied by *Value Line*'s current year EPS estimate and its projected 3-5 year EPS estimate. I then average this in with the IBES consensus estimate as an additional independent estimate, giving it a weight of 1 and weighting the IBES consensus according to the number of analysts who contributed estimates.

assets such that the returns investors expect to receive on their investments are commensurate with the risk of those assets relative to the market as a whole. The CAPM posits a risk-return relationship known as the Security Market Line (see Figure 3 in my Direct Testimony), in which the required expected return on an asset is proportional to that asset's risk relative to the market as measured by its "beta". More precisely, the CAPM states that the cost of capital for an investment S (e.g., a particular common stock), is given by the following equation:

$$\boldsymbol{r_s = r_f + \beta_s \times MRP} \tag{4}$$

where $\boldsymbol{r_S}$ is the required return on investment S;
$\boldsymbol{r_f}$ is the risk-free interest rate;
$\boldsymbol{\beta_S}$ is the beta risk measure for the investment S; and
$\boldsymbol{MRP}$ is the market equity risk premium.

The CAPM is based on portfolio theory, and recognizes two fundamental principles of finance: (1) investors seek to minimize the possible variance of their returns for a given level of expected returns (or alternatively, they demand higher *expected* returns when there is greater uncertainty about those returns), and (2) investors can reduce the variability of their returns by diversifying—constructing portfolios of many assets that do not all go up or down at the same time or to the same degree. Under the assumptions of the CAPM, the market participants will construct portfolios of risky investments that minimize risk for a given return so that the aggregate holdings of all investors represent the "market portfolio". The risk-return trade-off faced by investors then concerns their exposure to the risk inherent in the market portfolio, as they weight their investment capital between the portfolio of risky assets and the risk-free asset.

Because of the effects of diversification, the relevant measure of risk for an individual security is its *contribution* to the risk of the market portfolio. Therefore, beta (β) is defined to capture the sensitivity of the security's returns to the market's returns. Formally,

$$\boldsymbol{\beta_s} = \frac{covariance(\boldsymbol{r_s}, \boldsymbol{R_m})}{variance(\boldsymbol{R_m})} \tag{5}$$

where $\boldsymbol{R_m}$ is the return on the market portfolio.

Beta is usually calculated by statistically comparing (using regression analysis) the excess (positive or negative) of the return on the individual security over the government bond rate with the excess of the return on a market index such as the S&P 500 over a government bond rate.

The basic idea behind beta is the risk that cannot be diversified away in large portfolios is what matters to investors. Beta is a measure of the risks that *cannot* be eliminated by diversification. It is this non-diversifiable risk, or "systematic risk", for which investors require compensation in the form of higher expected returns. By definition, a stock with a beta equal to 1.0 has average non-diversifiable risk; its returns vary to the same degree as those on the market as a whole. According to the CAPM, the required return demanded by investors (i.e., the cost of equity) for investing in that stock will match the expected return on the market as a whole. Similarly, stocks with betas above 1.0 have more than average risk, and so have a cost of equity greater than the expected market return; those with betas below 1.0 have less than average risk, and are expected to earn lower than market levels of return.

B. Inputs to the CAPM

1. The Risk-free Interest Rate

The precise meaning of a "risk-free" asset according to the finance theory underlying the CAPM is an investment whose return is guaranteed, with no possibility that it will vary around its expected value in response to the movements of the broader market. (Equivalently, the CAPM beta of a risk-free asset is zero.) In developed economies like the U.S., government debt is generally considered have no default risk. In this sense they are "risk-free"; however, unless they are held to maturity, the rate of return on government bonds may in fact vary around their stated or expected yields.[6]

The theoretical CAPM is a single period model, meaning that it posits a relationship between risk and return over a single "holding period" of an investment. Because investors can rebalance their portfolios over short horizons, many academic studies and practical applications of the CAPM use the short-term government bond as the measure of the risk-free rate of return. However, regulators frequently use a version based on a measure of the long-term risk-free rate; e.g., a long-term government bond. I rely on the 20-year Treasury bond as a measure of the risk-free asset in this proceeding. [7] I use the term "risk-free rate" as describing the yield on the 20-year Treasury bond.

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[6] This is due to interest rate fluctuations that can change the market value of previously issued debt in relation to the yield on new issuances

[7] The use of a 20-year government bond is consistent with the measurement of the Ibbotson MRP and permits me to use a series that has been in consistent circulation since the 1990's (the 30-year government bond was not issued from 2002 to 2006).

However, I do not believe the *current* yield on long-term Treasury bonds is a good estimate for the risk-free rate that will prevail over the time period relevant to this proceeding as currently prevailing bond yields are near historic lows for a variety of circumstances that should not be expected to persist for the reasons discussed in my direct testimony. For this reason I rely on Blue Chip's forecast of 3.60% for the yield on a 10-year Treasury bond for 2020.[8] I adjust this value upward by 50 basis points, which is my estimate of the maturity premium for the 20-year over the 10-year Treasury Bond.[9] This gives me a risk-free rate of 4.10% for 2020.

2. The Market Equity Risk Premium

a. Historical Average Market Risk Premium

Like the cost of capital itself, the market risk premium is a forward-looking concept. It is by definition the premium above the risk-free interest rate that investors can *expect* to earn by investing in a value-weighted portfolio of all risky investments in the market. The premium is not directly observable, and must be inferred or forecasted based on known market information.

One commonly use method for estimating the MRP is to measure the historical average premium of market returns over the income returns on risk-free government bonds over some long historical period. When such a calculation is performed using the traditional industry standard Ibbotson data, the result is an arithmetic average of 7.07% for annual observed premiums of U.S. stock market returns over income returns on long-term (approximate average maturity of 20-years) U.S. Treasury bonds from 1926 to the present is 7.07%.[10]

b. Forward Looking Market Equity Risk Premium

An alternative approach to estimating the MRP eschews historical averages in favor of using current market information and forecasts to infer the expected return on the market as a whole, which can then be compared to prevailing government bond yields to estimate the equity risk premium. Bloomberg performs such estimates of country-specific MRPs by implementing the DCF model on the market as a whole—using forecast market-wide dividend yields and current level on market indexes; for the U.S. Bloomberg performs a multi-stage DCF using dividend-paying stocks in the S&P 500 to infer the expected market return.

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8 Blue Chip Economic Indicators, October 10, 2018.

9 This maturity premium is estimated by comparing the average excess yield on 20-year versus 10-year Treasury Bonds over the period January 1990 – September 2018, using data from Bloomberg. See Table No. BV-9.

10 Duff & Phelps, "2018 SBBI Yearbook," p. 10-21.

When calculated relative to 20-year Treasury bond yields, Bloomberg's estimate of the forward-looking market-implied MRP over the month leading up to my analysis was approximately 7.0%.[11]

c. Yield Spreads and the Market Equity Risk Premium

As shown in Figure 7 of my testimony the yield spreads for 20-year A rated utility debt over 20-year Treasury bonds is elevated relative to its historical norm by about 40 bps relative to its long-term average leading up to the 2008 financial crisis. This means that investors require a higher return on investment grade utility debt relative to the return on T-bonds than they did before the crisis and ensuing economic turmoil.

This information can be used to provide a quantitative benchmark for the implied increase in MRP based on a paper by Edwin J. Elton, et al., which documents that the yield spread on corporate bonds is normally a combination of a default premium, a tax premium, and a systematic risk premium.[12] Of these components, it is the systematic risk premium that likely explains the vast majority of the yield spread increase. In other words, unless the risk-free rate is underestimated as described above, the market equity risk premium has increased relative to its "normal" level.[13] For example, assuming a beta of 0.25 for A rated debt[14] means that an increase in the MRP of one percentage point translates into a ¼ percentage point increase in the risk premium on A rated debt (i.e., 0.25 (beta) times 1 percentage point (increase in MRP) = ¼ percentage point increase in yield spread). Thus, a 40 bps increase in the yield spread is therefore

[11] I note, however, that since the date of my analysis, Bloomberg's forward-looking DCF-implied expected market return has indicated a significantly higher MRP (relative to 20-year Treasury bond yields). For example, the average Bloomberg MRP measured for the month of December 2018 was approximately 7.7%.

[12] "Explaining the Rate Spread on Corporate Bonds," Edwin J. Elton, Martin J. Gruber, Deepak Agarwal, and Christopher Mann, *The Journal of Finance*, February 2001, pp. 247-277.

[13] In theory, some of the increase in yield spread for A rated debt may be due to an increase in default risk, but the increase in default risk for A rated debt is undoubtedly very small because utilities with A range rated debt have a low default risk. This means that the vast majority—if not all—of the increase in A rated yield spreads is due to a combination of the increased systematic risk premium and the downward pressure on the yields of government debt. Although there is no increase in the tax premium discussed in the Elton et al. paper due to coupon payments, there may be some increase due to a small tax effect resulting from the probability of increased capital gains taxes when the debt matures.

[14] Elton, *et al*. estimates the average beta on BBB-rated corporate debt as 0.26 over the period of their study, and A-rated debt will have a slightly lower beta than BBB-rated debt. I note that 0.25 is a conservatively high estimate of the beta on A-rated utility debt. Most academic estimates, including those presented in *Berk & Demarzo* that I utilize for my Hamada adjustments are significantly lower: in the range of 0.0 – 0.1 percent and would result in a substantially higher MRP estimate.

consistent with a 1.6 percentage point increase in the MRP ($\frac{0.40\%}{0.25} = 1.6\%$). Thus there is evidence that the current MRP is elevated relative to the historical MRP of 7.07%. My use of the historical MRP of 7.07% is therefore conservative.

C. THE EMPIRICAL CAPM

1. Description of the ECAPM

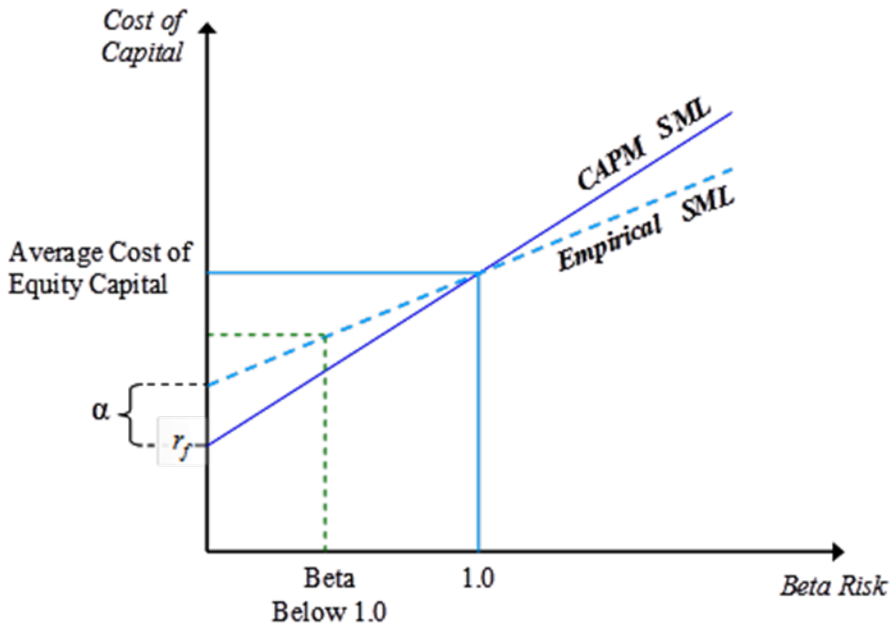
Empirical research has shown that the CAPM tends to overstate the actual sensitivity of the cost of capital to beta: low-beta stocks tend to have higher risk premiums than predicted by the CAPM and high-beta stocks tend to have lower risk premiums than predicted. A number of variations on the original CAPM theory have been proposed to explain this finding, but the observation itself can also be used to estimate the cost of capital directly, using beta to measure relative risk by making a direct empirical adjustment to the CAPM.

The Empirical CAPM (ECAPM) makes use of these empirical findings. It estimates the cost of capital with the equation,

$$\boldsymbol{r_S = r_f + \alpha + \beta_S} \times (\boldsymbol{MRP - \alpha}) \quad (6)$$

where $\boldsymbol{\alpha}$ is the "alpha" adjustment of the risk-return line, a constant, and the other symbols are defined as for the CAPM (see Equation (4)). The alpha adjustment has the effect of increasing the intercept but reducing the slope of the Security Market Line, which results in a Security Market Line that more closely matches the results of empirical tests. In other words, the ECAPM produces more accurate predictions of eventual realized risk premiums than does the CAPM.

Figure A-1
The Empirical Security Market Line



2. Academic Evidence on the Alpha Term in the ECAPM

Figure A-2 below summarizes the empirical results of tests of the CAPM, including their estimates of the "alpha" parameter necessary to improve the accuracy of the CAPM's predictions of realized returns.

Figure A-2

EMPIRICAL EVIDENCE ON THE ALPHA FACTOR IN ECAPM*

AUTHOR	RANGE OF ALPHA	PERIOD RELIED UPON
Black (1993)[1]	1% for betas 0 to 0.80	1931-1991
Black, Jensen and Scholes (1972)[2]	4.31%	1931-1965
Fama and McBeth (1972)	5.76%	1935-1968
Fama and French (1992)[3]	7.32%	1941-1990
Fama and French (2004)[4]	N/A	
Litzenberger and Ramaswamy (1979)[5]	5.32%	1936-1977
Litzenberger, Ramaswamy and Sosin (1980)	1.63% to 3.91%	1926-1978
Pettengill, Sundaram and Mathur (1995)[6]	4.6%	1936-1990

*The figures reported in this table are for the longest estimation period available and, when applicable, use the authors' recommended estimation technique. Many of the articles cited also estimate alpha for sub-periods and those alphas may vary.

[1] Black estimates alpha in a one step procedure rather than in an un-biased two-step procedure.
[2] Estimate a negative alpha for the subperiod 1931-39 which contain the depression years 1931-33 and 1937-39.
[3] Calculated using Ibbotson's data for the 30-day treasury yield.
[4] The article does not provide a specific estimate of alpha; however, it supports the general finding that the CAPM underestimates returns for low-beta stocks and overestimates returns for high-beta stocks.
[5] Relies on Lizenberger and Ramaswamy's before-tax estimation results. Comparable after-tax alpha estimate is 4.4%.
[6] Pettengill, Sundaram and Mathur rely on total returns for the period 1936 through 1990 and use 90-day treasuries. The 4.6% figure is calculated using auction averages 90-day treasuries back to 1941 as no other series were found this far back.

Sources:
Black, Fischer. 1993. Beta and Return. *The Journal of Portfolio Management* 20 (Fall): 8-18.
Black, F., Michael C. Jensen, and Myron Scholes. 1972. The Capital Asset Pricing Model: Some Empirical Tests, from Studies in the theory of Capital Markets. In *Studies in the Theory of Capital Markets*, edited by Michael C. Jensen, 79-121. New York: Praeger.
Fama, Eugene F. and James D. MacBeth. 1972. Risk, Returns and Equilibrium: Empirical Tests. *Journal of Political Economy* 81 (3): 607-636.
Fama, Eugene F. and Kenneth R. French. 1992. The Cross-Section of Expected Stock Returns. *Journal of Finance* 47 (June): 427-465.
Fama, Eugene F. and Kenneth R. French. 2004. The Capital Asset Pricing Model: Theory and Evidence. *Journal of Economic Perspectives* 18 (3): 25-46.
Litzenberger, Robert H. and Krishna Ramaswamy. 1979. The Effect of Personal Taxes and Dividends on Capital Asset Prices, Theory and Empirical Evidence. *Journal of Financial Economics* XX (June): 163-195.
Litzenberger, Robert H. and Krishna Ramaswamy and Howard Sosin. 1980. On the CAPM Approach to Estimation of a Public Utility's Cost of Equity Capital. *The Journal of Finance* 35 (2): 369-387.

III. Financial Risk and the Cost of Equity

A common issue in regulatory proceedings is how to apply data from a benchmark set of comparable securities when estimating a fair return on equity for the target/regulated company.[15] It may be tempting to simply estimate the cost of equity capital for each of the proxy companies (using one of the above approaches) and average them. After-all, the companies were chosen to be comparable in their business risk characteristics, so why would an investor necessarily prefer equity in one to the other (on average)?

The problem with this argument is that it ignores the fact that underlying asset risk (i.e., the risk inherent in the lines of business in which the firm invests its assets) for each company is typically divided between debt and equity holders. The firm's debt and equity are therefore financial derivatives of the underlying asset return, each offering a differently structured claim on the cash flows generated by those assets. Even though the risk of the underlying assets may be comparable, a different capital structure splits that risk differently between debt and equity holders. The relative structures of debt and equity claims are such that higher degrees of debt financing increase the variability of returns on equity, *even when the variability of asset returns remains constant*. As a consequence, otherwise identical firms with different capital structures will impose different levels of risk on their equity holders. Stated differently, increased leverage adds financial risk to a company's equity.[16]

A. The Effect of Financial Leverage on the Cost of Equity

To develop an intuition for the manner in which financial leverage affects the risk of equity, it is helpful to consider a concrete example. Figure A-3 and Figure A-4 below demonstrate the impact of leverage on the risk and return for equity by comparing equity's risk when a company uses no debt to finance its assets, and when it uses a 50-50 capital structure (i.e., it finances 50 percent of its assets with equity, 50 percent with debt). For illustrative purposes, the figures assume that the cash flows will be either $5 or $15 and that these two possibilities have the same chance of occurring (e.g., the chance that either occurs is ½).

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15 This is also a common valuation problem in general business contexts.

16 I refer to this effect in terms of *financial risk* because the additional risk to equity holders stems from how the company chooses to finance its assets. In this context financial risk is distinct from and independent of the *business risk* associated with the manner in which the firm deploys its cash flow generating assets. The impact of leverage on risk is conceptually no different than that faced by a homeowner who takes out a mortgage. The equity of a homeowner who finances his home with 90% debt is much riskier than the equity of one who only finances with 50% debt.

Figure A-3: All Equity Capital Structure

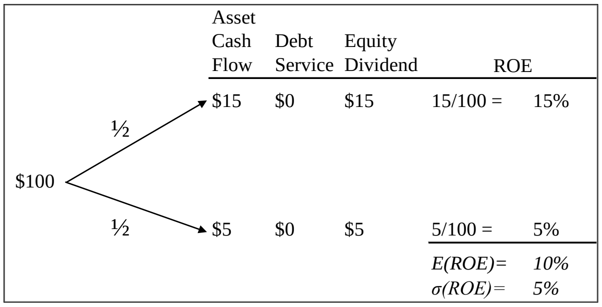
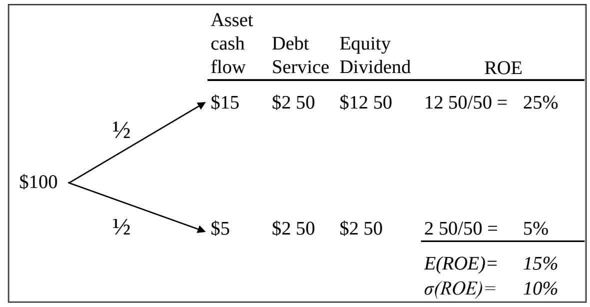


Figure A-4: 50/50 Capital Structure



In the figures, E(ROE) indicates the mean return and σ(ROE) represents the standard deviation. This simple example illustrates that the introduction of debt increases both the mean (expected) return to equity holders and the variance of that return, even though the firm's expected cash flows—which are a property of the line of business in which its assets are invested—are unaffected by the firm's financing choices. The "magic" of financial leverage is not magic at all—leveraged equity investors can only earn a higher return because they take on greater risk.

B. Methods to Account for Financial Risk

1. Cost of Equity Implied by the Overall Cost of Capital

If the companies in a proxy group are truly comparable in terms of the systematic risks of the underlying assets, then the overall cost of capital of each company should be about the same across companies (except for sampling error), so long as they do not use extreme leverage or no leverage. The intuition here is as follows. A firm's asset value (and return) is allocated between equity and debt holders.[17] The expected return to the underlying asset is therefore equal to the

[17] Other claimants can be added to the weighted average if they exist. For example, when a firm's capital structure contains preferred equity, the term $\frac{P}{V} \times r_p$ is added to the expression for the overall cost of capital shown in Equation (7), where P refers to the market value of preferred equity, r_P is the cost of preferred equity and $V = E + D + P$. In my analysis, I attribute the same implied yield to the cost of preferred equity as to the cost of debt.

value weighted average of the expected returns to equity and debt holders – which is the overall cost of capital ($\boldsymbol{r}^*$), or the expected return on the assets of the firm as a whole.[18]

$$\boldsymbol{r}^* = \frac{E}{V} \times r_E + \frac{D}{V} \times r_D(1 - \tau_c) \tag{7}$$

where r_D is the market cost of debt,
r_E is the market cost of equity,
τ_c is the corporate income tax rate,
D is the market value of the firm's debt,
E is the market value of the firm's equity, and
$V = E + D$ is the total market value of the firm.

Since the overall cost of capital is the cost of capital for the underlying asset risk, and this is comparable across companies, it is reasonable to believe that the overall cost of capital of the underlying companies should also be comparable, so long as capital structures do not involve unusual leverage ratios compared to other companies in the industry.[19]

The notion that the overall cost of capital is constant across a broad middle range of capital structures is based upon the Modigliani-Miller theorem that choice of financing does not affect the firm's value. Franco Modigliani and Merton Miller eventually won Nobel Prizes in part for their work on the effects of debt.[20] Their 1958 paper made what is in retrospect a very simple point: if there are no taxes and no risk to the use of excessive debt, use of debt will have no effect on a company's operating cash flows (i.e., the cash flows to investors as a group, debt and equity combined). If the operating cash flows are the same regardless of whether the company

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[18] As this is on an after-tax basis, the cost of debt reflects the tax value of interest deductibility. Note that the precise formulation of the weighted average formula representing the required return on the firm's *assets* independent of financing (sometimes called the *unlevered* cost of capital) depends on specific assumptions made regarding the value of tax shields from tax-deductible corporate debt, the role of personal income tax, and the cost of financial distress. See Taggart, Robert A., "Consistent Valuation and Cost of Capital Expressions with Corporate and Personal Taxes," *Financial Management*, 1991; 20(3) for a detailed discussion of these assumptions and formulations. Equation (7) represents the overall weighted average cost of capital to the firm, which can be assumed to be constant across a relatively broad range of capital structures.

[19] Empirically, companies within the same industry tend to have similar capital structures, while typical capital structures may vary between industries, so whether a leverage ratio is "unusual" depends upon the company's line of business.

[20] Franco Modigliani and Merton H. Miller (1958), "The Cost of Capital, Corporation Finance and the Theory of Investment," *American Economic Review*, 48, pp. 261-297.

finances mostly with debt or mostly with equity, then the value of the firm cannot be affected at all by the debt ratio. In cost of capital terms, this means the overall cost of capital is constant regardless of the debt ratio, too.

Obviously, the simple and elegant Modigliani-Miller theorem makes some counterfactual assumptions: no taxes and no cost of financial distress from excessive debt. However, subsequent research, including some by Modigliani and Miller,[21] showed that while taxes and costs to financial distress affect a firm's incentives when choosing its capital structure as well as its overall cost of capital,[22] the latter can still be shown to be constant across a broad range of capital structures.[23]

This reasoning suggests that one could compute the overall cost of capital for each of the proxy companies and then average to produce an estimate of the overall cost of capital associated with the underlying asset risk. Assuming that the overall cost of capital is constant, one can then re-arrange the overall cost of capital formula to estimate what the implied cost of equity is at the target company's capital structure on a book value basis.[24]

2. Unlevering and Relevering Betas in the CAPM (Hamada Adjustment)

An alternative approach to account for the impact of financial risk is to examine the impact of leverage on beta. Notice that this means working within the CAPM framework as the methodology cannot be applied directly to the DCF models.

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[21] Franco Modigliani and Merton H. Miller (1963), "Corporate Income Taxes and the Cost of Capital: A Correction," *American Economic Review*, 53, pp. 433-443.

[22] When a company uses a high level of debt financing, for example, there is significant risk of bankruptcy and all the costs associated with it. The so called costs of financial distress that occurs when a company is over-leveraged can increase its cost of capital. In contrast a company can generally decrease its cost of capital by taking on reasonable levels of debt, owing in part to the deductibility of interest from corporate taxes.

[23] This is a simplified treatment of what is generally a complex and on-going area of academic investigation. The roles of taxes, market imperfections and constraints, etc. are areas of on-going research and differing assumptions can yield subtly different formulations for how to formulate the weighted average cost of capital that is constant over all (or most) capital structures.

[24] Market value capital structures are used in estimating the overall cost of capital for the proxy companies.

Recognizing that under general conditions, the value of a firm can be decomposed into its value with and without a tax shield, I obtain:[25]

$$V = V_U + PV(ITS) \tag{8}$$

where $V = E + D$ is the total value of the firm as in Equation (7),

V_U is the "unlevered" value of the firm—its value if financed entirely by equity

$PV(ITS)$ represents the present value of the interest tax shields associated with debt

For a company with a fixed book-value capital structure and no additional costs to leverage, it can be shown that the formula above implies:

$$r_E = r_U + \frac{D}{E}(1 - \tau_c)(r_U - r_D) \tag{9}$$

where r_U is the "unlevered cost of capital"—the required return on assets if the firm's assets were financed with 100% equity and zero debt—and the other parameters are defined as in Equation (7).

Replacing each of these returns by their CAPM representation and simplifying them gives the following relationship between the "levered" equity beta β_L for a firm (i.e., the one observed in market data as a consequence of the firm's actual market value capital structure) and the "unlevered" beta β_U that would be measured for the same firm if it had no debt in its capital structure:

$$\beta_L = \beta_U + \frac{D}{E}(1 - \tau_c)(\beta_U - \beta_D) \tag{10}$$

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[25] This follows development in Fernandez (2003). Other standard papers in this area include Hamada (1972), Miles and Ezzell (1985), Harris and Pringle (1985), Fernandez (2006). (See Fernandez, P., "Levered and Unlevered Beta," IESE Business School Working Paper WP-488, University of Navarra, Jan 2003 (rev. May 2006); Hamada, R.S., "The Effect of the Firm's Capital Structure on the Systematic Risk of Common Stock," *Journal of Finance*, 27, May 1972, pp. 435-452; Miles, J.A. and J.R. Ezzell, "Reformulating Tax Shield Valuation: A Note," *Journal of Finance*, XL5, Dec 1985, pp. 1485-1492; Harris, R.S. and J.J. Pringle, "Risk-Adjusted Discount Rates Extensions form the Average-Risk Case," *Journal of Financial Research*, Fall 1985, pp. 237-244; Fernandez, P., "The Value of Tax Shields Depends Only on the Net Increases of Debt," IESE Business School Working Paper WP-613, University of Navarra, 2006.) Additional discussion can be found in Brealey, Myers, and Allen (2014).

where β_D is the beta on the firm's debt. The unlevered beta is assumed to be constant with respect to capital structure, reflecting as it does the systematic risk of the firm's assets. Since the beta on an investment grade firm's debt is much lower than the beta of its assets (i.e., $\beta_D < \beta_U$), this equation embodies the fact that increasing financial leverage (and thereby increasing the debt to equity ratio) increases the systematic risk of *levered* equity (β_L).

An alternative formulation derived by Harris and Pringle (1985) provides the following equation that holds when the market value capital structures (rather than book value) are assumed to be held constant:

$$\beta_L = \beta_U + \frac{D}{E}(\beta_U - \beta_D) \tag{11}$$

Unlike Equation (10), Equation (11) does not include an adjustment for the corporate tax deduction. However, both equations account for the fact that increased financial leverage increases the systematic risk of equity that will be measured by its market beta. And both equations allow an analyst to adjust for differences in financial risk by translating back and forth between β_L and β_U. In principal, Equation (10) is more appropriate for use with regulated utilities, which are typically deemed to maintain a fixed book value capital structure. However, I employ both formulations when adjusting my CAPM estimates for financial risk, and consider the results as sensitivities in my analysis.

It is clear that the beta of debt needs to be determined as an input to either Equation (10), or Equation (11). Rather than estimating debt betas, I rely on the standard financial textbook of Professors Berk & DeMarzo, who report a debt beta of 0.05 for A rated debt and a beta of 0.10 for BBB rated debt.[26]

Once a decision on debt betas is made, the levered equity beta of each proxy company can be computed (in this case by Value Line) from market data and then translated to an unlevered beta at the company's market value capital structure. The unlevered betas for the proxy companies are comparable on an "apples to apples" basis, since they reflect the systematic risk inherent in the assets of the proxy companies, independent of their financing. The unlevered betas are averaged to produce an estimate of the industry's unlevered beta. To estimate the cost of equity for the

[26] Berk, J. & DeMarzo, P., *Corporate Finance, 2nd Edition.* 2011 Prentice Hall, p. 389.

regulated target company, this estimate of unlevered beta can be "re-levered" to the regulated company's capital structure, and CAPM reapplied with this levered beta, which reflects both the business and financial risk of the target company.

Hamada adjustment procedures—so-named for Professor Robert S. Hamada who contributed to their development[27]—are ubiquitous among finance practitioners when using the CAPM to estimate discount rates.

[27] Hamada, R.S., "The Effect of the Firm's Capital Structure on the Systematic Risk of Common Stock", *The Journal of Finance*, 27(2), 1971, pp. 435-452.

Table No. BV-1

Table of Contents

Table No. BV-2

Classification of Companies by Assets

Company	Regulated Assets
ALLETE	M
Alliant Energy	R
Amer. Elec. Power	R
Ameren Corp.	R
CMS Energy Corp.	R
DTE Energy	M
Entergy Corp.	R
MGE Energy	M
OGE Energy	R
Otter Tail Corp.	R
AVANGRID Inc.	M
Consol. Edison	R
Duke Energy	R
Eversource Energy	R
NextEra Energy	M
PPL Corp.	R
Public Serv. Enterprise	M
Southern Co.	R
Unitil Corp.	R
Edison Int'l	R
El Paso Electric	R
IDACORP Inc.	R
Pinnacle West Capital	R
PNM Resources	R
Portland General	R
Xcel Energy Inc.	R

Sources and Notes:
Calculations based on EEI definitions and Company 10K filings:
R = Regulated (greater than 80 percent of total assets are regulated).
M = Mostly Regulated (50 to 80 percent of total assets are regulated).
D = Diversified (less than 50 percent of total assets are regulated).

Table No. BV-3

Market Value of the Electric Proxy Group

Panel A: ALLETE

($MM)

	DCF Capital Structure	3rd Quarter, 2018	3rd Quarter, 2017	3rd Quarter, 2016	3rd Quarter, 2015	3rd Quarter, 2014	3rd Quarter, 2013	Notes
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	$2,116	$2,116	$2,043	$1,873	$1,822	$1,529	$1,288	[a]
Shares Outstanding (in millions) - Common	51	51	51	50	49	45	41	[b]
Price per Share - Common	$79	$75	$78	$61	$49	$46	$48	[c]
Market Value of Common Equity	$4,068	$3,878	$3,963	$2,997	$2,393	$2,048	$1,941	[d] = [b] x [c].
Market Value of GP Equity	n/a	n/a	n/a	n/a	n/a	n/a	n/a	[e]
Total Market Value of Equity	$4,068	$3,878	$3,963	$2,997	$2,393	$2,048	$1,941	[f]= [d]
Market to Book Value of Common Equity	1.92	1.83	1.94	1.60	1.31	1.34	1.51	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	$0	$0	$0	$0	$0	$0	$0	[h]
Market Value of Preferred Equity	$0	$0	$0	$0	$0	$0	$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	$439	$439	$388	$362	$403	$358	$369	[j]
Current Liabilities	$403	$403	$291	$404	$318	$287	$224	[k]
Current Portion of Long-Term Debt	$57	$57	$64	$187	$49	$85	$38	[l]
Net Working Capital	$93	$93	$162	$144	$135	$156	$183	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	$0	$0	$0	$0	$0	$3	$1	[n]
Adjusted Short-Term Debt	$0	$0	$0	$0	$0	$0	$0	[o] = See Sources and Notes.
Long-Term Debt	$1,462	$1,462	$1,445	$1,359	$1,549	$1,289	$1,064	[p]
Book Value of Long-Term Debt	$1,518	$1,518	$1,509	$1,546	$1,598	$1,375	$1,102	[q] = [l] + [o] + [p].
Adjustment to Book Value of Long-Term Debt	$114	$114	$85	$71	$111	$22	$126	[r] = See Sources and Notes.
Market Value of Long-Term Debt	$1,633	$1,633	$1,593	$1,617	$1,709	$1,396	$1,228	[s] = [q] + [r].
Market Value of Debt	$1,633	$1,633	$1,593	$1,617	$1,709	$1,396	$1,228	[t] = [s].
MARKET VALUE OF FIRM	$5,700	$5,510	$5,556	$4,614	$4,102	$3,444	$3,169	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	71.36%	70.37%	71.32%	64.96%	58.33%	59.47%	61.26%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	28.64%	29.63%	28.68%	35.04%	41.67%	40.53%	38.74%	[x] = [t] / [u].

Sources and Notes:
Bloomberg as of November 30, 2018
Capital structure from 3rd Quarter, 2018 calculated using respective balance sheet information and 15-day average prices ending at period end.
The DCF Capital structure is calculated using 3rd Quarter, 2018 balance sheet information and a 15-trading day average closing price ending on 11/30/2018.
Prices are reported in Supporting Schedule #1 to Table No. BV-6.
[o] =
(1): 0 if [m] > 0.
(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].
(3): [n] if [m] < 0 and |[m]| > [n].
[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2017 10-K.

Table No. BV-3

Market Value of the Electric Proxy Group

Panel B: Alliant Energy

($MM)

	DCF Capital Structure	3rd Quarter, 2018	3rd Quarter, 2017	3rd Quarter, 2016	3rd Quarter, 2015	3rd Quarter, 2014	3rd Quarter, 2013	Notes
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	$4,570	$4,570	$4,154	$3,859	$3,745	$3,436	$3,267	[a]
Shares Outstanding (in millions) - Common	236	236	231	228	227	222	222	[b]
Price per Share - Common	$45	$43	$42	$39	$28	$28	$25	[c]
Market Value of Common Equity	$10,579	$10,181	$9,787	$8,841	$6,434	$6,291	$5,494	[d] = [b] x [c].
Market Value of GP Equity	n/a	n/a	n/a	n/a	n/a	n/a	n/a	[e]
Total Market Value of Equity	$10,579	$10,181	$9,787	$8,841	$6,434	$6,291	$5,494	[f]= [d]
Market to Book Value of Common Equity	2.31	2.23	2.36	2.29	1.72	1.83	1.68	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	$400	$400	$200	$200	$200	$200	$200	[h]
Market Value of Preferred Equity	$400	$400	$200	$200	$200	$200	$200	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	$1,125	$1,125	$752	$958	$1,088	$962	$880	[j]
Current Liabilities	$1,548	$1,548	$1,470	$1,370	$991	$1,742	$1,053	[k]
Current Portion of Long-Term Debt	$506	$506	$105	$314	$3	$493	$48	[l]
Net Working Capital	$83	$83	($613)	($98)	$100	($287)	($124)	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	$137	$137	$485	$238	$109	$354	$237	[n]
Adjusted Short-Term Debt	$0	$0	$485	$98	$0	$287	$124	[o] = See Sources and Notes.
Long-Term Debt	$5,248	$5,248	$4,255	$3,817	$3,856	$2,800	$3,105	[p]
Book Value of Long-Term Debt	$5,754	$5,754	$4,846	$4,229	$3,859	$3,579	$3,278	[q] = [l] + [o] + [p].
Adjustment to Book Value of Long-Term Debt	$581	$581	$479	$501	$629	$376	$722	[r] = See Sources and Notes.
Market Value of Long-Term Debt	$6,336	$6,336	$5,324	$4,729	$4,487	$3,955	$4,000	[s] = [q] + [r].
Market Value of Debt	$6,336	$6,336	$5,324	$4,729	$4,487	$3,955	$4,000	[t] = [s].
MARKET VALUE OF FIRM	$17,314	$16,917	$15,311	$13,770	$11,121	$10,446	$9,694	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	61.10%	60.18%	63.92%	64.21%	57.85%	60.22%	56.68%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	2.31%	2.36%	1.31%	1.45%	1.80%	1.91%	2.06%	[w] = [i] / [u].
Debt - Market Value Ratio	36.59%	37.45%	34.78%	34.34%	40.35%	37.86%	41.26%	[x] = [t] / [u].

Sources and Notes:
Bloomberg as of November 30, 2018
Capital structure from 3rd Quarter, 2018 calculated using respective balance sheet information and 15-day average prices ending at period end.
The DCF Capital structure is calculated using 3rd Quarter, 2018 balance sheet information and a 15-trading day average closing price ending on 11/30/2018.
Prices are reported in Supporting Schedule #1 to Table No. BV-6.
[o] =
(1): 0 if [m] > 0.
(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].
(3): [n] if [m] < 0 and |[m]| > [n].
[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2017 10-K.

Table No. BV-3

Market Value of the Electric Proxy Group

Panel C: Amer. Elec. Power

($MM)

	DCF Capital Structure	3rd Quarter, 2018	3rd Quarter, 2017	3rd Quarter, 2016	3rd Quarter, 2015	3rd Quarter, 2014	3rd Quarter, 2013	Notes
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	$19,047	$19,047	$18,078	$17,322	$17,699	$16,868	$15,762	[a]
Shares Outstanding (in millions) - Common	493	493	492	492	491	489	487	[b]
Price per Share - Common	$77	$72	$72	$65	$55	$53	$43	[c]
Market Value of Common Equity	$37,722	$35,280	$35,328	$32,042	$27,037	$25,812	$21,167	[d] = [b] x [c].
Market Value of GP Equity	n/a	n/a	n/a	n/a	n/a	n/a	n/a	[e]
Total Market Value of Equity	$37,722	$35,280	$35,328	$32,042	$27,037	$25,812	$21,167	[f]= [d]
Market to Book Value of Common Equity	1.98	1.85	1.95	1.85	1.53	1.53	1.34	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	$0	$0	$0	$0	$0	$0	$0	[h]
Market Value of Preferred Equity	$0	$0	$0	$0	$0	$0	$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	$4,692	$4,692	$4,068	$5,949	$4,548	$4,111	$4,317	[j]
Current Liabilities	$8,426	$8,426	$7,322	$7,779	$7,058	$7,457	$5,692	[k]
Current Portion of Long-Term Debt	$1,904	$1,904	$2,359	$2,385	$1,826	$2,381	$1,366	[l]
Net Working Capital	($1,830)	($1,830)	($895)	$555	($684)	($965)	($9)	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	$2,243	$2,243	$1,059	$1,478	$782	$1,282	$1,218	[n]
Adjusted Short-Term Debt	$1,830	$1,830	$895	$0	$684	$965	$9	[o] = See Sources and Notes.
Long-Term Debt	$20,870	$20,870	$18,362	$17,320	$17,600	$15,677	$16,202	[p]
Book Value of Long-Term Debt	$24,604	$24,604	$21,617	$19,705	$20,110	$19,023	$17,577	[q] = [l] + [o] + [p].
Adjustment to Book Value of Long-Term Debt	$2,476	$2,476	$1,821	$1,629	$2,391	$1,295	$3,150	[r] = See Sources and Notes.
Market Value of Long-Term Debt	$27,080	$27,080	$23,437	$21,333	$22,501	$20,318	$20,727	[s] = [q] + [r].
Market Value of Debt	$27,080	$27,080	$23,437	$21,333	$22,501	$20,318	$20,727	[t] = [s].
MARKET VALUE OF FIRM	$64,802	$62,360	$58,765	$53,375	$49,538	$46,130	$41,894	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	58.21%	56.57%	60.12%	60.03%	54.58%	55.95%	50.53%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	41.79%	43.43%	39.88%	39.97%	45.42%	44.05%	49.47%	[x] = [t] / [u].

Sources and Notes:
Bloomberg as of November 30, 2018
Capital structure from 3rd Quarter, 2018 calculated using respective balance sheet information and 15-day average prices ending at period end.
The DCF Capital structure is calculated using 3rd Quarter, 2018 balance sheet information and a 15-trading day average closing price ending on 11/30/2018.
Prices are reported in Supporting Schedule #1 to Table No. BV-6.
[o] =
(1): 0 if [m] > 0.
(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].
(3): [n] if [m] < 0 and |[m]| > [n].
[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2017 10-K.

Table No. BV-3

Market Value of the Electric Proxy Group

Panel D: Ameren Corp.

($MM)

	DCF Capital Structure	3rd Quarter, 2018	3rd Quarter, 2017	3rd Quarter, 2016	3rd Quarter, 2015	3rd Quarter, 2014	3rd Quarter, 2013	Notes
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	$7,656	$7,656	$7,345	$7,193	$7,014	$6,774	$6,574	[a]
Shares Outstanding (in millions) - Common	244	244	243	243	243	243	243	[b]
Price per Share - Common	$68	$64	$59	$50	$40	$38	$34	[c]
Market Value of Common Equity	$16,720	$15,714	$14,327	$12,115	$9,802	$9,318	$8,311	[d] = [b] x [c].
Market Value of GP Equity	n/a	n/a	n/a	n/a	n/a	n/a	n/a	[e]
Total Market Value of Equity	$16,720	$15,714	$14,327	$12,115	$9,802	$9,318	$8,311	[f]= [d]
Market to Book Value of Common Equity	2.18	2.05	1.95	1.68	1.40	1.38	1.26	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	$0	$0	$0	$0	$0	$0	$0	[h]
Market Value of Preferred Equity	$0	$0	$0	$0	$0	$0	$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	$1,640	$1,640	$1,581	$1,599	$1,983	$1,942	$3,273	[j]
Current Liabilities	$2,580	$2,580	$2,581	$2,291	$2,489	$2,119	$3,228	[k]
Current Portion of Long-Term Debt	$649	$649	$777	$431	$395	$119	$884	[l]
Net Working Capital	($291)	($291)	($223)	($261)	($111)	($58)	$929	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	$521	$521	$446	$608	$783	$753	$25	[n]
Adjusted Short-Term Debt	$291	$291	$223	$261	$111	$58	$0	[o] = See Sources and Notes.
Long-Term Debt	$7,614	$7,614	$6,922	$6,607	$5,981	$5,825	$5,274	[p]
Book Value of Long-Term Debt	$8,554	$8,554	$7,922	$7,299	$6,487	$6,002	$6,158	[q] = [l] + [o] + [p].
Adjustment to Book Value of Long-Term Debt	$596	$596	$496	$539	$895	$546	$953	[r] = See Sources and Notes.
Market Value of Long-Term Debt	$9,150	$9,150	$8,418	$7,838	$7,382	$6,548	$7,111	[s] = [q] + [r].
Market Value of Debt	$9,150	$9,150	$8,418	$7,838	$7,382	$6,548	$7,111	[t] = [s].
MARKET VALUE OF FIRM	$25,870	$24,864	$22,745	$19,953	$17,184	$15,866	$15,422	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	64.63%	63.20%	62.99%	60.72%	57.04%	58.73%	53.89%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	35.37%	36.80%	37.01%	39.28%	42.96%	41.27%	46.11%	[x] = [t] / [u].

Sources and Notes:
Bloomberg as of November 30, 2018
Capital structure from 3rd Quarter, 2018 calculated using respective balance sheet information and 15-day average prices ending at period end.
The DCF Capital structure is calculated using 3rd Quarter, 2018 balance sheet information and a 15-trading day average closing price ending on 11/30/2018.
Prices are reported in Supporting Schedule #1 to Table No. BV-6.
[o] =
(1): 0 if [m] > 0.
(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].
(3): [n] if [m] < 0 and |[m]| > [n].
[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2017 10-K.

Table No. BV-3

Market Value of the Electric Proxy Group

Panel E: CMS Energy Corp.

($MM)

	DCF Capital Structure	3rd Quarter, 2018	3rd Quarter, 2017	3rd Quarter, 2016	3rd Quarter, 2015	3rd Quarter, 2014	3rd Quarter, 2013	Notes
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	$4,749	$4,749	$4,535	$4,259	$3,902	$3,670	$3,396	[a]
Shares Outstanding (in millions) - Common	283	283	282	279	277	275	266	[b]
Price per Share - Common	$51	$50	$47	$43	$34	$30	$26	[c]
Market Value of Common Equity	$14,456	$14,027	$13,310	$11,917	$9,338	$8,161	$7,018	[d] = [b] x [c].
Market Value of GP Equity	n/a	n/a	n/a	n/a	n/a	n/a	n/a	[e]
Total Market Value of Equity	$14,456	$14,027	$13,310	$11,917	$9,338	$8,161	$7,018	[f]= [d]
Market to Book Value of Common Equity	3.04	2.95	2.94	2.80	2.39	2.22	2.07	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	$0	$0	$0	$0	$0	$0	$0	[h]
Market Value of Preferred Equity	$0	$0	$0	$0	$0	$0	$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	$2,374	$2,374	$2,121	$2,198	$2,123	$2,734	$2,401	[j]
Current Liabilities	$3,442	$3,442	$2,261	$2,069	$1,788	$1,648	$1,464	[k]
Current Portion of Long-Term Debt	$1,971	$1,971	$980	$1,005	$741	$690	$532	[l]
Net Working Capital	$903	$903	$840	$1,134	$1,076	$1,776	$1,469	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	$279	$279	$230	$75	$68	$0	$0	[n]
Adjusted Short-Term Debt	$0	$0	$0	$0	$0	$0	$0	[o] = See Sources and Notes.
Long-Term Debt	$8,944	$8,944	$9,121	$8,832	$8,014	$8,171	$7,229	[p]
Book Value of Long-Term Debt	$10,915	$10,915	$10,101	$9,837	$8,755	$8,861	$7,761	[q] = [l] + [o] + [p].
Adjustment to Book Value of Long-Term Debt	$511	$511	$449	$474	$750	$726	$1,118	[r] = See Sources and Notes.
Market Value of Long-Term Debt	$11,426	$11,426	$10,550	$10,311	$9,505	$9,587	$8,879	[s] = [q] + [r].
Market Value of Debt	$11,426	$11,426	$10,550	$10,311	$9,505	$9,587	$8,879	[t] = [s].
MARKET VALUE OF FIRM	$25,882	$25,453	$23,860	$22,228	$18,843	$17,748	$15,897	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	55.85%	55.11%	55.78%	53.61%	49.56%	45.98%	44.15%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	44.15%	44.89%	44.22%	46.39%	50.44%	54.02%	55.85%	[x] = [t] / [u].

Sources and Notes:
Bloomberg as of November 30, 2018
Capital structure from 3rd Quarter, 2018 calculated using respective balance sheet information and 15-day average prices ending at period end.
The DCF Capital structure is calculated using 3rd Quarter, 2018 balance sheet information and a 15-trading day average closing price ending on 11/30/2018.
Prices are reported in Supporting Schedule #1 to Table No. BV-6.
[o] =
(1): 0 if [m] > 0.
(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].
(3): [n] if [m] < 0 and |[m]| > [n].
[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2017 10-K.

Table No. BV-3

Market Value of the Electric Proxy Group

Panel F: DTE Energy

($MM)

	DCF Capital Structure	3rd Quarter, 2018	3rd Quarter, 2017	3rd Quarter, 2016	3rd Quarter, 2015	3rd Quarter, 2014	3rd Quarter, 2013	Notes
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	$10,207	$10,207	$9,373	$9,130	$8,812	$8,169	$7,876	[a]
Shares Outstanding (in millions) - Common	182	182	179	179	179	177	177	[b]
Price per Share - Common	$118	$110	$110	$94	$78	$76	$67	[c]
Market Value of Common Equity	$21,527	$20,096	$19,692	$16,898	$13,951	$13,475	$11,792	[d] = [b] x [c].
Market Value of GP Equity	n/a	n/a	n/a	n/a	n/a	n/a	n/a	[e]
Total Market Value of Equity	$21,527	$20,096	$19,692	$16,898	$13,951	$13,475	$11,792	[f]= [d]
Market to Book Value of Common Equity	2.11	1.97	2.10	1.85	1.58	1.65	1.50	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	$0	$0	$0	$0	$0	$0	$0	[h]
Market Value of Preferred Equity	$0	$0	$0	$0	$0	$0	$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	$3,103	$3,103	$2,815	$2,595	$2,700	$2,755	$2,549	[j]
Current Liabilities	$2,117	$2,117	$2,598	$1,969	$2,273	$2,805	$3,008	[k]
Current Portion of Long-Term Debt	$1	$1	$109	$15	$468	$274	$896	[l]
Net Working Capital	$987	$987	$326	$641	$895	$224	$437	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	$77	$77	$659	$410	$185	$653	$271	[n]
Adjusted Short-Term Debt	$0	$0	$0	$0	$0	$0	$0	[o] = See Sources and Notes.
Long-Term Debt	$13,620	$13,620	$11,795	$9,478	$8,856	$7,909	$6,846	[p]
Book Value of Long-Term Debt	$13,621	$13,621	$11,904	$9,493	$9,324	$8,183	$7,742	[q] = [l] + [o] + [p].
Adjustment to Book Value of Long-Term Debt	$986	$986	$635	$550	$897	$381	$1,080	[r] = See Sources and Notes.
Market Value of Long-Term Debt	$14,607	$14,607	$12,539	$10,043	$10,221	$8,564	$8,822	[s] = [q] + [r].
Market Value of Debt	$14,607	$14,607	$12,539	$10,043	$10,221	$8,564	$8,822	[t] = [s].
MARKET VALUE OF FIRM	$36,134	$34,703	$32,231	$26,941	$24,172	$22,039	$20,614	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	59.58%	57.91%	61.10%	62.72%	57.71%	61.14%	57.20%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	40.42%	42.09%	38.90%	37.28%	42.29%	38.86%	42.80%	[x] = [t] / [u].

Sources and Notes:
Bloomberg as of November 30, 2018
Capital structure from 3rd Quarter, 2018 calculated using respective balance sheet information and 15-day average prices ending at period end.
The DCF Capital structure is calculated using 3rd Quarter, 2018 balance sheet information and a 15-trading day average closing price ending on 11/30/2018.
Prices are reported in Supporting Schedule #1 to Table No. BV-6.
[o] =
(1): 0 if [m] > 0.
(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].
(3): [n] if [m] < 0 and |[m]| > [n].
[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2017 10-K.

Table No. BV-3

Market Value of the Electric Proxy Group

Panel G: Entergy Corp.

($MM)

	DCF Capital Structure	3rd Quarter, 2018	3rd Quarter, 2017	3rd Quarter, 2016	3rd Quarter, 2015	3rd Quarter, 2014	3rd Quarter, 2013	Notes
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	$8,413	$8,413	$8,690	$10,069	$9,157	$10,149	$9,408	[a]
Shares Outstanding (in millions) - Common	181	181	180	179	178	180	178	[b]
Price per Share - Common	$86	$83	$78	$79	$64	$76	$64	[c]
Market Value of Common Equity	$15,579	$14,961	$13,998	$14,147	$11,376	$13,736	$11,359	[d] = [b] x [c].
Market Value of GP Equity	n/a	n/a	n/a	n/a	n/a	n/a	n/a	[e]
Total Market Value of Equity	$15,579	$14,961	$13,998	$14,147	$11,376	$13,736	$11,359	[f]= [d]
Market to Book Value of Common Equity	1.85	1.78	1.61	1.40	1.24	1.35	1.21	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	$198	$198	$203	$233	$211	$305	$281	[h]
Market Value of Preferred Equity	$198	$198	$203	$233	$211	$305	$281	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	$3,695	$3,695	$3,471	$4,340	$4,117	$4,265	$3,490	[j]
Current Liabilities	$5,751	$5,751	$4,461	$3,452	$3,454	$4,454	$3,439	[k]
Current Portion of Long-Term Debt	$736	$736	$871	$753	$281	$1,117	$209	[l]
Net Working Capital	($1,320)	($1,320)	($118)	$1,641	$945	$927	$260	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	$1,947	$1,947	$1,353	$433	$782	$891	$1,106	[n]
Adjusted Short-Term Debt	$1,320	$1,320	$118	$0	$0	$0	$0	[o] = See Sources and Notes.
Long-Term Debt	$15,802	$15,802	$14,000	$13,887	$13,080	$11,665	$12,308	[p]
Book Value of Long-Term Debt	$17,858	$17,858	$14,990	$14,640	$13,362	$12,782	$12,517	[q] = [l] + [o] + [p].
Adjustment to Book Value of Long-Term Debt	$292	$292	($17)	$253	$208	($156)	$210	[r] = See Sources and Notes.
Market Value of Long-Term Debt	$18,150	$18,150	$14,973	$14,892	$13,569	$12,625	$12,728	[s] = [q] + [r].
Market Value of Debt	$18,150	$18,150	$14,973	$14,892	$13,569	$12,625	$12,728	[t] = [s].
MARKET VALUE OF FIRM	$33,926	$33,309	$29,174	$29,272	$25,156	$26,665	$24,367	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	45.92%	44.92%	47.98%	48.33%	45.22%	51.51%	46.62%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	0.58%	0.59%	0.70%	0.80%	0.84%	1.14%	1.15%	[w] = [i] / [u].
Debt - Market Value Ratio	53.50%	54.49%	51.32%	50.88%	53.94%	47.35%	52.23%	[x] = [t] / [u].

Sources and Notes:
Bloomberg as of November 30, 2018
Capital structure from 3rd Quarter, 2018 calculated using respective balance sheet information and 15-day average prices ending at period end.
The DCF Capital structure is calculated using 3rd Quarter, 2018 balance sheet information and a 15-trading day average closing price ending on 11/30/2018.
Prices are reported in Supporting Schedule #1 to Table No. BV-6.
[o] =
(1): 0 if [m] > 0.
(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].
(3): [n] if [m] < 0 and |[m]| > [n].
[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2017 10-K.

Table No. BV-3

Market Value of the Electric Proxy Group

Panel H: MGE Energy

($MM)

	DCF Capital Structure	3rd Quarter, 2018	3rd Quarter, 2017	3rd Quarter, 2016	3rd Quarter, 2015	3rd Quarter, 2014	3rd Quarter, 2013	Notes
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	$812	$812	$753	$720	$689	$654	$613	[a]
Shares Outstanding (in millions) - Common	35	35	35	35	35	35	35	[b]
Price per Share - Common	$64	$65	$65	$57	$40	$39	$36	[c]
Market Value of Common Equity	$2,218	$2,260	$2,265	$1,975	$1,396	$1,340	$1,244	[d] = [b] x [c].
Market Value of GP Equity	n/a	n/a	n/a	n/a	n/a	n/a	n/a	[e]
Total Market Value of Equity	$2,218	$2,260	$2,265	$1,975	$1,396	$1,340	$1,244	[f]= [d]
Market to Book Value of Common Equity	2.73	2.78	3.01	2.74	2.03	2.05	2.03	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	$0	$0	$0	$0	$0	$0	$0	[h]
Market Value of Preferred Equity	$0	$0	$0	$0	$0	$0	$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	$281	$281	$255	$249	$242	$225	$214	[j]
Current Liabilities	$98	$98	$85	$86	$74	$82	$79	[k]
Current Portion of Long-Term Debt	$5	$5	$4	$4	$4	$4	$4	[l]
Net Working Capital	$187	$187	$175	$167	$172	$147	$139	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	$0	$0	$7	$0	$0	$0	$0	[n]
Adjusted Short-Term Debt	$0	$0	$0	$0	$0	$0	$0	[o] = See Sources and Notes.
Long-Term Debt	$494	$494	$389	$384	$392	$396	$400	[p]
Book Value of Long-Term Debt	$499	$499	$394	$388	$396	$400	$405	[q] = [l] + [o] + [p].
Adjustment to Book Value of Long-Term Debt	$48	$48	$39	$40	$58	$28	$66	[r] = See Sources and Notes.
Market Value of Long-Term Debt	$547	$547	$433	$428	$454	$429	$470	[s] = [q] + [r].
Market Value of Debt	$547	$547	$433	$428	$454	$429	$470	[t] = [s].
MARKET VALUE OF FIRM	$2,765	$2,808	$2,698	$2,404	$1,850	$1,769	$1,714	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	80.21%	80.51%	83.96%	82.18%	75.46%	75.77%	72.56%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	19.79%	19.49%	16.04%	17.82%	24.54%	24.23%	27.44%	[x] = [t] / [u].

Sources and Notes:
Bloomberg as of November 30, 2018
Capital structure from 3rd Quarter, 2018 calculated using respective balance sheet information and 15-day average prices ending at period end.
The DCF Capital structure is calculated using 3rd Quarter, 2018 balance sheet information and a 15-trading day average closing price ending on 11/30/2018.
Prices are reported in Supporting Schedule #1 to Table No. BV-6.
[o] =
(1): 0 if [m] > 0.
(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].
(3): [n] if [m] < 0 and |[m]| > [n].
[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2017 10-K.

Table No. BV-3

Market Value of the Electric Proxy Group

Panel I: OGE Energy

($MM)

	DCF Capital Structure	3rd Quarter, 2018	3rd Quarter, 2017	3rd Quarter, 2016	3rd Quarter, 2015	3rd Quarter, 2014	3rd Quarter, 2013	Notes
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	$4,030	$4,030	$3,617	$3,445	$3,353	$3,243	$2,995	[a]
Shares Outstanding (in millions) - Common	200	200	200	200	200	199	198	[b]
Price per Share - Common	$39	$37	$36	$32	$27	$36	$36	[c]
Market Value of Common Equity	$7,800	$7,331	$7,219	$6,386	$5,399	$7,266	$7,104	[d] = [b] x [c].
Market Value of GP Equity	n/a	n/a	n/a	n/a	n/a	n/a	n/a	[e]
Total Market Value of Equity	$7,800	$7,331	$7,219	$6,386	$5,399	$7,266	$7,104	[f]= [d]
Market to Book Value of Common Equity	1.94	1.82	2.00	1.85	1.61	2.24	2.37	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	$0	$0	$0	$0	$0	$0	$0	[h]
Market Value of Preferred Equity	$0	$0	$0	$0	$0	$0	$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	$642	$642	$600	$547	$753	$740	$758	[j]
Current Liabilities	$841	$841	$954	$795	$587	$869	$942	[k]
Current Portion of Long-Term Debt	$250	$250	$350	$125	$110	$0	$0	[l]
Net Working Capital	$51	$51	($4)	($123)	$276	($129)	($184)	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	$0	$0	$147	$213	$0	$411	$447	[n]
Adjusted Short-Term Debt	$0	$0	$4	$123	$0	$129	$184	[o] = See Sources and Notes.
Long-Term Debt	$2,897	$2,897	$2,750	$2,505	$2,646	$2,510	$2,400	[p]
Book Value of Long-Term Debt	$3,147	$3,147	$3,103	$2,753	$2,756	$2,639	$2,584	[q] = [l] + [o] + [p].
Adjustment to Book Value of Long-Term Debt	$389	$389	$273	($244)	($206)	$253	$548	[r] = See Sources and Notes.
Market Value of Long-Term Debt	$3,535	$3,535	$3,377	$2,510	$2,550	$2,891	$3,132	[s] = [q] + [r].
Market Value of Debt	$3,535	$3,535	$3,377	$2,510	$2,550	$2,891	$3,132	[t] = [s].
MARKET VALUE OF FIRM	$11,335	$10,866	$10,596	$8,896	$7,949	$10,157	$10,236	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	68.81%	67.46%	68.13%	71.79%	67.92%	71.54%	69.41%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	31.19%	32.54%	31.87%	28.21%	32.08%	28.46%	30.59%	[x] = [t] / [u].

Sources and Notes:
Bloomberg as of November 30, 2018
Capital structure from 3rd Quarter, 2018 calculated using respective balance sheet information and 15-day average prices ending at period end.
The DCF Capital structure is calculated using 3rd Quarter, 2018 balance sheet information and a 15-trading day average closing price ending on 11/30/2018.
Prices are reported in Supporting Schedule #1 to Table No. BV-6.
[o] =
(1): 0 if [m] > 0.
(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].
(3): [n] if [m] < 0 and |[m]| > [n].
[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2017 10-K.

Table No. BV-3

Market Value of the Electric Proxy Group

Panel J: Otter Tail Corp.

($MM)

	DCF Capital Structure	3rd Quarter, 2018	3rd Quarter, 2017	3rd Quarter, 2016	3rd Quarter, 2015	3rd Quarter, 2014	3rd Quarter, 2013	Notes
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	$725	$725	$693	$657	$598	$563	$530	[a]
Shares Outstanding (in millions) - Common	40	40	40	39	38	37	36	[b]
Price per Share - Common	$48	$48	$43	$35	$26	$27	$28	[c]
Market Value of Common Equity	$1,900	$1,907	$1,703	$1,380	$972	$1,007	$1,006	[d] = [b] x [c].
Market Value of GP Equity	n/a	n/a	n/a	n/a	n/a	n/a	n/a	[e]
Total Market Value of Equity	$1,900	$1,907	$1,703	$1,380	$972	$1,007	$1,006	[f]= [d]
Market to Book Value of Common Equity	2.62	2.63	2.46	2.10	1.63	1.79	1.90	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	$0	$0	$0	$0	$0	$0	$0	[h]
Market Value of Preferred Equity	$0	$0	$0	$0	$0	$0	$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	$241	$241	$228	$204	$274	$298	$310	[j]
Current Liabilities	$163	$163	$246	$246	$237	$200	$220	[k]
Current Portion of Long-Term Debt	$0	$0	$0	$85	$0	$0	$0	[l]
Net Working Capital	$78	$78	($18)	$43	$37	$98	$91	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	$15	$15	$104	$37	$87	$39	$40	[n]
Adjusted Short-Term Debt	$0	$0	$18	$0	$0	$0	$0	[o] = See Sources and Notes.
Long-Term Debt	$590	$590	$490	$461	$498	$499	$437	[p]
Book Value of Long-Term Debt	$590	$590	$508	$546	$499	$499	$437	[q] = [l] + [o] + [p].
Adjustment to Book Value of Long-Term Debt	$52	$52	$45	$65	$102	$38	$69	[r] = See Sources and Notes.
Market Value of Long-Term Debt	$642	$642	$554	$611	$601	$537	$507	[s] = [q] + [r].
Market Value of Debt	$642	$642	$554	$611	$601	$537	$507	[t] = [s].
MARKET VALUE OF FIRM	$2,543	$2,549	$2,257	$1,991	$1,573	$1,544	$1,513	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	74.74%	74.80%	75.47%	69.31%	61.81%	65.24%	66.49%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	25.26%	25.20%	24.53%	30.69%	38.19%	34.76%	33.51%	[x] = [t] / [u].

Sources and Notes:
Bloomberg as of November 30, 2018
Capital structure from 3rd Quarter, 2018 calculated using respective balance sheet information and 15-day average prices ending at period end.
The DCF Capital structure is calculated using 3rd Quarter, 2018 balance sheet information and a 15-trading day average closing price ending on 11/30/2018.
Prices are reported in Supporting Schedule #1 to Table No. BV-6.
[o] =
(1): 0 if [m] > 0.
(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].
(3): [n] if [m] < 0 and |[m]| > [n].
[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2017 10-K.

Table No. BV-3

Market Value of the Electric Proxy Group

Panel K: AVANGRID Inc.

($MM)

	DCF Capital Structure	3rd Quarter, 2018	3rd Quarter, 2017	3rd Quarter, 2016	3rd Quarter, 2015	3rd Quarter, 2014	3rd Quarter, 2013	Notes
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	$15,128	$15,128	$15,202	$15,038	$3,999	$3,999	$3,999	[a]
Shares Outstanding (in millions) - Common	309	309	309	309	-	-	-	[b]
Price per Share - Common	$50	$49	$47	$42	n/a	n/a	n/a	[c]
Market Value of Common Equity	$15,345	$15,110	$14,573	$13,022	n/a	n/a	n/a	[d] = [b] x [c].
Market Value of GP Equity	n/a	n/a	n/a	n/a	n/a	n/a	n/a	[e]
Total Market Value of Equity	$15,345	$15,110	$14,573	$13,022	n/a	n/a	n/a	[f]= [d]
Market to Book Value of Common Equity	1.01	1.00	0.96	0.87	n/a	n/a	n/a	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	$0	$0	$0	$0	$0	$0	$0	[h]
Market Value of Preferred Equity	$0	$0	$0	$0	$0	$0	$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	$1,963	$1,963	$2,021	$2,153	$915	$915	$915	[j]
Current Liabilities	$2,911	$2,911	$2,934	$2,153	$1,189	$1,189	$1,189	[k]
Current Portion of Long-Term Debt	$523	$523	$267	$187	$23	$23	$23	[l]
Net Working Capital	($425)	($425)	($646)	$187	($251)	($251)	($251)	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	$500	$500	$731	$3	$305	$305	$305	[n]
Adjusted Short-Term Debt	$425	$425	$646	$0	$251	$251	$251	[o] = See Sources and Notes.
Long-Term Debt	$5,096	$5,096	$4,767	$4,399	$2,889	$2,889	$2,889	[p]
Book Value of Long-Term Debt	$6,044	$6,044	$5,680	$4,586	$3,163	$3,163	$3,163	[q] = [l] + [o] + [p].
Adjustment to Book Value of Long-Term Debt	$603	$603	$694	$455	$473	$0	$0	[r] = See Sources and Notes.
Market Value of Long-Term Debt	$6,647	$6,647	$6,374	$5,041	$3,636	$3,163	$3,163	[s] = [q] + [r].
Market Value of Debt	$6,647	$6,647	$6,374	$5,041	$3,636	$3,163	$3,163	[t] = [s].
MARKET VALUE OF FIRM	$21,992	$21,757	$20,947	$18,063	n/a	n/a	n/a	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	69.78%	69.45%	69.57%	72.09%	n/a	n/a	n/a	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	n/a	n/a	n/a	[w] = [i] / [u].
Debt - Market Value Ratio	30.22%	30.55%	30.43%	27.91%	n/a	n/a	n/a	[x] = [t] / [u].

Sources and Notes:
Bloomberg as of November 30, 2018
Capital structure from 3rd Quarter, 2018 calculated using respective balance sheet information and 15-day average prices ending at period end.
The DCF Capital structure is calculated using 3rd Quarter, 2018 balance sheet information and a 15-trading day average closing price ending on 11/30/2018.
Prices are reported in Supporting Schedule #1 to Table No. BV-6.
[o] =
(1): 0 if [m] > 0.
(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].
(3): [n] if [m] < 0 and |[m]| > [n].
[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2017 10-K.

Table No. BV-3

Market Value of the Electric Proxy Group

Panel L: Consol. Edison

($MM)

	DCF Capital Structure	3rd Quarter, 2018	3rd Quarter, 2017	3rd Quarter, 2016	3rd Quarter, 2015	3rd Quarter, 2014	3rd Quarter, 2013	Notes
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	$15,887	$15,887	$15,102	$14,267	$13,040	$12,707	$12,166	[a]
Shares Outstanding (in millions) - Common	311	311	310	305	293	293	293	[b]
Price per Share - Common	$78	$78	$83	$76	$65	$57	$56	[c]
Market Value of Common Equity	$24,385	$24,364	$25,682	$23,296	$18,927	$16,614	$16,301	[d] = [b] x [c].
Market Value of GP Equity	n/a	n/a	n/a	n/a	n/a	n/a	n/a	[e]
Total Market Value of Equity	$24,385	$24,364	$25,682	$23,296	$18,927	$16,614	$16,301	[f]= [d]
Market to Book Value of Common Equity	1.53	1.53	1.70	1.63	1.45	1.31	1.34	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	$0	$0	$0	$0	$0	$0	$0	[h]
Market Value of Preferred Equity	$0	$0	$0	$0	$0	$0	$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	$3,356	$3,356	$3,096	$3,154	$3,505	$3,519	$3,704	[j]
Current Liabilities	$5,401	$5,401	$3,915	$3,591	$4,429	$3,873	$4,373	[k]
Current Portion of Long-Term Debt	$1,128	$1,128	$687	$346	$761	$210	$483	[l]
Net Working Capital	($917)	($917)	($132)	($91)	($163)	($144)	($186)	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	$1,352	$1,352	$356	$601	$1,160	$1,425	$1,220	[n]
Adjusted Short-Term Debt	$917	$917	$132	$91	$163	$144	$186	[o] = See Sources and Notes.
Long-Term Debt	$15,480	$15,480	$14,651	$13,747	$11,521	$10,986	$10,495	[p]
Book Value of Long-Term Debt	$17,525	$17,525	$15,470	$14,184	$12,445	$11,340	$11,164	[q] = [l] + [o] + [p].
Adjustment to Book Value of Long-Term Debt	$2,118	$2,118	$1,319	$1,111	$1,807	$1,108	$2,167	[r] = See Sources and Notes.
Market Value of Long-Term Debt	$19,643	$19,643	$16,789	$15,295	$14,252	$12,448	$13,331	[s] = [q] + [r].
Market Value of Debt	$19,643	$19,643	$16,789	$15,295	$14,252	$12,448	$13,331	[t] = [s].
MARKET VALUE OF FIRM	$44,028	$44,007	$42,471	$38,591	$33,179	$29,062	$29,632	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	55.39%	55.36%	60.47%	60.37%	57.05%	57.17%	55.01%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	44.61%	44.64%	39.53%	39.63%	42.95%	42.83%	44.99%	[x] = [t] / [u].

Sources and Notes:
Bloomberg as of November 30, 2018
Capital structure from 3rd Quarter, 2018 calculated using respective balance sheet information and 15-day average prices ending at period end.
The DCF Capital structure is calculated using 3rd Quarter, 2018 balance sheet information and a 15-trading day average closing price ending on 11/30/2018.
Prices are reported in Supporting Schedule #1 to Table No. BV-6.
[o] =
(1): 0 if [m] > 0.
(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].
(3): [n] if [m] < 0 and |[m]| > [n].
[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2017 10-K.

Table No. BV-3

Market Value of the Electric Proxy Group

Panel M: Duke Energy

($MM)

	DCF Capital Structure	3rd Quarter, 2018	3rd Quarter, 2017	3rd Quarter, 2016	3rd Quarter, 2015	3rd Quarter, 2014	3rd Quarter, 2013	Notes
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	$42,995	$42,995	$41,631	$40,489	$39,832	$41,412	$41,165	[a]
Shares Outstanding (in millions) - Common	713	713	700	689	688	707	706	[b]
Price per Share - Common	$87	$81	$86	$81	$70	$74	$67	[c]
Market Value of Common Equity	$62,032	$57,441	$60,010	$55,487	$47,883	$52,276	$47,133	[d] = [b] x [c].
Market Value of GP Equity	n/a	n/a	n/a	n/a	n/a	n/a	n/a	[e]
Total Market Value of Equity	$62,032	$57,441	$60,010	$55,487	$47,883	$52,276	$47,133	[f]= [d]
Market to Book Value of Common Equity	1.44	1.34	1.44	1.37	1.20	1.26	1.14	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	$0	$0	$0	$0	$0	$0	$0	[h]
Market Value of Preferred Equity	$0	$0	$0	$0	$0	$0	$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	$9,520	$9,520	$7,706	$13,534	$10,195	$11,575	$10,418	[j]
Current Liabilities	$13,922	$13,922	$10,820	$12,076	$10,516	$8,251	$9,239	[k]
Current Portion of Long-Term Debt	$3,455	$3,455	$2,485	$3,201	$2,536	$1,156	$2,307	[l]
Net Working Capital	($947)	($947)	($629)	$4,659	$2,215	$4,480	$3,486	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	$2,891	$2,891	$1,899	$3,011	$2,419	$1,787	$1,278	[n]
Adjusted Short-Term Debt	$947	$947	$629	$0	$0	$0	$0	[o] = See Sources and Notes.
Long-Term Debt	$50,507	$50,507	$48,929	$43,964	$37,667	$38,702	$37,402	[p]
Book Value of Long-Term Debt	$54,909	$54,909	$52,043	$47,165	$40,203	$39,858	$39,709	[q] = [l] + [o] + [p].
Adjustment to Book Value of Long-Term Debt	$3,052	$3,052	$1,266	$2,899	$4,546	$2,336	$4,540	[r] = See Sources and Notes.
Market Value of Long-Term Debt	$57,961	$57,961	$53,309	$50,064	$44,749	$42,194	$44,249	[s] = [q] + [r].
Market Value of Debt	$57,961	$57,961	$53,309	$50,064	$44,749	$42,194	$44,249	[t] = [s].
MARKET VALUE OF FIRM								
	$119,993	$115,402	$113,319	$105,551	$92,632	$94,470	$91,382	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	51.70%	49.77%	52.96%	52.57%	51.69%	55.34%	51.58%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	48.30%	50.23%	47.04%	47.43%	48.31%	44.66%	48.42%	[x] = [t] / [u].

Sources and Notes:
Bloomberg as of November 30, 2018
Capital structure from 3rd Quarter, 2018 calculated using respective balance sheet information and 15-day average prices ending at period end.
The DCF Capital structure is calculated using 3rd Quarter, 2018 balance sheet information and a 15-trading day average closing price ending on 11/30/2018.
Prices are reported in Supporting Schedule #1 to Table No. BV-6.
[o] =
(1): 0 if [m] > 0.
(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].
(3): [n] if [m] < 0 and |[m]| > [n].
[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2017 10-K.

Table No. BV-3

Market Value of the Electric Proxy Group

Panel N: Eversource Energy

($MM)

	DCF Capital Structure	3rd Quarter, 2018	3rd Quarter, 2017	3rd Quarter, 2016	3rd Quarter, 2015	3rd Quarter, 2014	3rd Quarter, 2013	Notes
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	$11,409	$11,409	$10,998	$10,637	$10,294	$9,891	$9,517	[a]
Shares Outstanding (in millions) - Common	317	317	317	317	317	317	315	[b]
Price per Share - Common	$67	$62	$62	$55	$48	$45	$41	[c]
Market Value of Common Equity	$21,134	$19,745	$19,570	$17,382	$15,117	$14,213	$12,939	[d] = [b] x [c].
Market Value of GP Equity	n/a	n/a	n/a	n/a	n/a	n/a	n/a	[e]
Total Market Value of Equity	$21,134	$19,745	$19,570	$17,382	$15,117	$14,213	$12,939	[f]= [d]
Market to Book Value of Common Equity	1.85	1.73	1.78	1.63	1.47	1.44	1.36	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	$156	$156	$156	$156	$156	$156	$156	[h]
Market Value of Preferred Equity	$156	$156	$156	$156	$156	$156	$156	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	$2,153	$2,153	$2,403	$2,415	$2,368	$2,102	$2,018	[j]
Current Liabilities	$3,630	$3,630	$2,620	$2,642	$2,972	$2,930	$3,378	[k]
Current Portion of Long-Term Debt	$387	$387	$958	$374	$229	$246	$608	[l]
Net Working Capital	($1,090)	($1,090)	$741	$147	($375)	($583)	($752)	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	$1,067	$1,067	$18	$735	$1,016	$1,047	$1,343	[n]
Adjusted Short-Term Debt	$1,067	$1,067	$0	$0	$375	$583	$752	[o] = See Sources and Notes.
Long-Term Debt	$12,152	$12,152	$10,468	$9,235	$8,757	$8,167	$7,444	[p]
Book Value of Long-Term Debt	$13,606	$13,606	$11,426	$9,609	$9,362	$8,995	$8,804	[q] = [l] + [o] + [p].
Adjustment to Book Value of Long-Term Debt	$552	$552	$377	$391	$637	$133	$677	[r] = See Sources and Notes.
Market Value of Long-Term Debt	$14,158	$14,158	$11,803	$10,000	$9,999	$9,128	$9,482	[s] = [q] + [r].
Market Value of Debt	$14,158	$14,158	$11,803	$10,000	$9,999	$9,128	$9,482	[t] = [s].
MARKET VALUE OF FIRM	$35,448	$34,058	$31,529	$27,538	$25,272	$23,496	$22,576	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	59.62%	57.97%	62.07%	63.12%	59.82%	60.49%	57.31%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	0.44%	0.46%	0.49%	0.56%	0.62%	0.66%	0.69%	[w] = [i] / [u].
Debt - Market Value Ratio	39.94%	41.57%	37.44%	36.32%	39.56%	38.85%	42.00%	[x] = [t] / [u].

Sources and Notes:
Bloomberg as of November 30, 2018
Capital structure from 3rd Quarter, 2018 calculated using respective balance sheet information and 15-day average prices ending at period end.
The DCF Capital structure is calculated using 3rd Quarter, 2018 balance sheet information and a 15-trading day average closing price ending on 11/30/2018.
Prices are reported in Supporting Schedule #1 to Table No. BV-6.
[o] =
(1): 0 if [m] > 0.
(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].
(3): [n] if [m] < 0 and |[m]| > [n].
[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2017 10-K.

Table No. BV-3

Market Value of the Electric Proxy Group

Panel O: NextEra Energy

($MM)

	DCF Capital Structure	3rd Quarter, 2018	3rd Quarter, 2017	3rd Quarter, 2016	3rd Quarter, 2015	3rd Quarter, 2014	3rd Quarter, 2013	Notes
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	$34,252	$34,252	$26,398	$23,907	$22,318	$18,810	$17,409	[a]
Shares Outstanding (in millions) - Common	478	478	470	467	461	436	431	[b]
Price per Share - Common	$178	$170	$148	$125	$97	$95	$80	[c]
Market Value of Common Equity	$85,285	$81,411	$69,521	$58,248	$44,783	$41,205	$34,660	[d] = [b] x [c].
Market Value of GP Equity	n/a	n/a	n/a	n/a	n/a	n/a	n/a	[e]
Total Market Value of Equity	$85,285	$81,411	$69,521	$58,248	$44,783	$41,205	$34,660	[f]= [d]
Market to Book Value of Common Equity	2.49	2.38	2.63	2.44	2.01	2.19	1.99	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	$0	$0	$0	$0	$0	$0	$0	[h]
Market Value of Preferred Equity	$0	$0	$0	$0	$0	$0	$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	$8,349	$8,349	$7,027	$6,747	$6,657	$5,633	$5,472	[j]
Current Liabilities	$12,807	$12,807	$11,604	$10,456	$10,371	$9,572	$9,213	[k]
Current Portion of Long-Term Debt	$2,649	$2,649	$2,285	$2,364	$2,497	$3,385	$3,933	[l]
Net Working Capital	($1,809)	($1,809)	($2,292)	($1,345)	($1,217)	($554)	$192	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	$2,890	$2,890	$2,329	$1,118	$2,163	$1,185	$915	[n]
Adjusted Short-Term Debt	$1,809	$1,809	$2,292	$1,118	$1,217	$554	$0	[o] = See Sources and Notes.
Long-Term Debt	$27,048	$27,048	$30,345	$28,195	$25,604	$24,853	$23,862	[p]
Book Value of Long-Term Debt	$31,506	$31,506	$34,922	$31,677	$29,318	$28,792	$27,795	[q] = [l] + [o] + [p].
Adjustment to Book Value of Long-Term Debt	$2,313	$2,313	$1,205	$1,515	$2,461	$884	$2,227	[r] = See Sources and Notes.
Market Value of Long-Term Debt	$33,819	$33,819	$36,127	$33,192	$31,779	$29,676	$30,022	[s] = [q] + [r].
Market Value of Debt	$33,819	$33,819	$36,127	$33,192	$31,779	$29,676	$30,022	[t] = [s].
MARKET VALUE OF FIRM	$119,104	$115,230	$105,648	$91,440	$76,562	$70,881	$64,682	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	71.61%	70.65%	65.80%	63.70%	58.49%	58.13%	53.59%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	28.39%	29.35%	34.20%	36.30%	41.51%	41.87%	46.41%	[x] = [t] / [u].

Sources and Notes:
Bloomberg as of November 30, 2018
Capital structure from 3rd Quarter, 2018 calculated using respective balance sheet information and 15-day average prices ending at period end.
The DCF Capital structure is calculated using 3rd Quarter, 2018 balance sheet information and a 15-trading day average closing price ending on 11/30/2018.
Prices are reported in Supporting Schedule #1 to Table No. BV-6.
[o] =
(1): 0 if [m] > 0.
(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].
(3): [n] if [m] < 0 and |[m]| > [n].
[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2017 10-K.

Table No. BV-3

Market Value of the Electric Proxy Group

Panel P: PPL Corp.

($MM)

	DCF Capital Structure	3rd Quarter, 2018	3rd Quarter, 2017	3rd Quarter, 2016	3rd Quarter, 2015	3rd Quarter, 2014	3rd Quarter, 2013	Notes
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	$11,783	$11,783	$10,692	$9,975	$10,222	$13,974	$12,344	[a]
Shares Outstanding (in millions) - Common	720	720	688	679	672	665	630	[b]
Price per Share - Common	$31	$30	$39	$35	$31	$31	$28	[c]
Market Value of Common Equity	$22,403	$21,335	$26,705	$23,739	$20,835	$20,387	$17,754	[d] = [b] x [c].
Market Value of GP Equity	n/a	n/a	n/a	n/a	n/a	n/a	n/a	[e]
Total Market Value of Equity	$22,403	$21,335	$26,705	$23,739	$20,835	$20,387	$17,754	[f]= [d]
Market to Book Value of Common Equity	1.90	1.81	2.50	2.38	2.04	1.46	1.44	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	$0	$0	$0	$0	$0	$0	$0	[h]
Market Value of Preferred Equity	$0	$0	$0	$0	$0	$0	$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	$2,545	$2,545	$2,331	$2,099	$2,990	$5,760	$4,971	[j]
Current Liabilities	$4,383	$4,383	$4,149	$3,412	$4,468	$5,412	$4,948	[k]
Current Portion of Long-Term Debt	$330	$330	$448	$443	$1,460	$235	$751	[l]
Net Working Capital	($1,508)	($1,508)	($1,370)	($870)	($18)	$583	$774	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	$1,549	$1,549	$1,211	$636	$557	$1,099	$499	[n]
Adjusted Short-Term Debt	$1,508	$1,508	$1,211	$636	$18	$0	$0	[o] = See Sources and Notes.
Long-Term Debt	$19,924	$19,924	$19,110	$18,069	$17,745	$20,522	$19,092	[p]
Book Value of Long-Term Debt	$21,762	$21,762	$20,769	$19,148	$19,223	$20,757	$19,843	[q] = [l] + [o] + [p].
Adjustment to Book Value of Long-Term Debt	$3,588	$3,588	$3,029	$2,929	$3,568	$1,761	$3,473	[r] = See Sources and Notes.
Market Value of Long-Term Debt	$25,350	$25,350	$23,798	$22,077	$22,791	$22,518	$23,316	[s] = [q] + [r].
Market Value of Debt	$25,350	$25,350	$23,798	$22,077	$22,791	$22,518	$23,316	[t] = [s].
MARKET VALUE OF FIRM	$47,753	$46,685	$50,503	$45,816	$43,626	$42,905	$41,070	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	46.91%	45.70%	52.88%	51.81%	47.76%	47.52%	43.23%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	53.09%	54.30%	47.12%	48.19%	52.24%	52.48%	56.77%	[x] = [t] / [u].

Sources and Notes:
Bloomberg as of November 30, 2018
Capital structure from 3rd Quarter, 2018 calculated using respective balance sheet information and 15-day average prices ending at period end.
The DCF Capital structure is calculated using 3rd Quarter, 2018 balance sheet information and a 15-trading day average closing price ending on 11/30/2018.
Prices are reported in Supporting Schedule #1 to Table No. BV-6.
[o] =
(1): 0 if [m] > 0.
(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].
(3): [n] if [m] < 0 and |[m]| > [n].
[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2017 10-K.

Table No. BV-3

Market Value of the Electric Proxy Group

Panel Q: Public Serv. Enterprise

($MM)

	DCF Capital Structure	3rd Quarter, 2018	3rd Quarter, 2017	3rd Quarter, 2016	3rd Quarter, 2015	3rd Quarter, 2014	3rd Quarter, 2013	Notes
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	$14,359	$14,359	$13,124	$13,476	$12,933	$12,083	$11,338	[a]
Shares Outstanding (in millions) - Common	504	504	505	505	505	506	506	[b]
Price per Share - Common	$54	$52	$46	$43	$40	$38	$33	[c]
Market Value of Common Equity	$27,266	$26,428	$23,230	$21,487	$20,317	$18,979	$16,702	[d] = [b] x [c].
Market Value of GP Equity	n/a	n/a	n/a	n/a	n/a	n/a	n/a	[e]
Total Market Value of Equity	$27,266	$26,428	$23,230	$21,487	$20,317	$18,979	$16,702	[f]= [d]
Market to Book Value of Common Equity	1.90	1.84	1.77	1.59	1.57	1.57	1.47	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	$0	$0	$0	$0	$0	$0	$0	[h]
Market Value of Preferred Equity	$0	$0	$0	$0	$0	$0	$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	$3,215	$3,215	$3,081	$3,209	$3,204	$3,846	$3,741	[j]
Current Liabilities	$4,485	$4,485	$3,831	$2,804	$3,604	$3,136	$3,235	[k]
Current Portion of Long-Term Debt	$1,450	$1,450	$1,250	$662	$1,106	$574	$1,010	[l]
Net Working Capital	$180	$180	$500	$1,067	$706	$1,284	$1,516	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	$419	$419	$202	$255	$20	$0	$0	[n]
Adjusted Short-Term Debt	$0	$0	$0	$0	$0	$0	$0	[o] = See Sources and Notes.
Long-Term Debt	$12,909	$12,909	$11,274	$10,697	$8,132	$8,389	$7,476	[p]
Book Value of Long-Term Debt	$14,359	$14,359	$12,524	$11,359	$9,238	$8,963	$8,486	[q] = [l] + [o] + [p].
Adjustment to Book Value of Long-Term Debt	$994	$994	$608	$688	$1,005	$418	$1,385	[r] = See Sources and Notes.
Market Value of Long-Term Debt	$15,353	$15,353	$13,132	$12,047	$10,243	$9,381	$9,871	[s] = [q] + [r].
Market Value of Debt	$15,353	$15,353	$13,132	$12,047	$10,243	$9,381	$9,871	[t] = [s].
MARKET VALUE OF FIRM	$42,619	$41,781	$36,362	$33,534	$30,560	$28,360	$26,573	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	63.98%	63.25%	63.89%	64.08%	66.48%	66.92%	62.85%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	36.02%	36.75%	36.11%	35.92%	33.52%	33.08%	37.15%	[x] = [t] / [u].

Sources and Notes:
Bloomberg as of November 30, 2018
Capital structure from 3rd Quarter, 2018 calculated using respective balance sheet information and 15-day average prices ending at period end.
The DCF Capital structure is calculated using 3rd Quarter, 2018 balance sheet information and a 15-trading day average closing price ending on 11/30/2018.
Prices are reported in Supporting Schedule #1 to Table No. BV-6.
[o] =
(1): 0 if [m] > 0.
(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].
(3): [n] if [m] < 0 and |[m]| > [n].
[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2017 10-K.

Table No. BV-3

Market Value of the Electric Proxy Group

Panel R: Southern Co.

($MM)

	DCF Capital Structure	3rd Quarter, 2018	3rd Quarter, 2017	3rd Quarter, 2016	3rd Quarter, 2015	3rd Quarter, 2014	3rd Quarter, 2013	Notes
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	$24,877	$24,877	$24,082	$24,547	$20,664	$19,857	$18,778	[a]
Shares Outstanding (in millions) - Common	999	999	999	980	909	900	882	[b]
Price per Share - Common	$47	$44	$50	$52	$43	$44	$42	[c]
Market Value of Common Equity	$46,568	$43,762	$49,457	$51,295	$39,408	$39,217	$36,620	[d] = [b] x [c].
Market Value of GP Equity	n/a	n/a	n/a	n/a	n/a	n/a	n/a	[e]
Total Market Value of Equity	$46,568	$43,762	$49,457	$51,295	$39,408	$39,217	$36,620	[f]= [d]
Market to Book Value of Common Equity	1.87	1.76	2.05	2.09	1.91	1.97	1.95	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	$324	$324	$823	$727	$727	$1,131	$1,131	[h]
Market Value of Preferred Equity	$324	$324	$823	$727	$727	$1,131	$1,131	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	$9,384	$9,384	$9,202	$9,658	$6,270	$6,258	$5,785	[j]
Current Liabilities	$12,965	$12,965	$12,603	$10,567	$9,689	$6,890	$5,704	[k]
Current Portion of Long-Term Debt	$3,013	$3,013	$3,505	$2,254	$3,313	$2,398	$1,307	[l]
Net Working Capital	($568)	($568)	$104	$1,345	($106)	$1,766	$1,388	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	$2,564	$2,564	$2,579	$1,670	$1,490	$361	$750	[n]
Adjusted Short-Term Debt	$568	$568	$0	$0	$106	$0	$0	[o] = See Sources and Notes.
Long-Term Debt	$41,425	$41,425	$44,042	$41,550	$22,326	$21,699	$21,053	[p]
Book Value of Long-Term Debt	$45,006	$45,006	$47,547	$43,804	$25,745	$24,097	$22,360	[q] = [l] + [o] + [p].
Adjustment to Book Value of Long-Term Debt	$3,197	$3,197	$1,206	$697	$2,002	$547	$1,950	[r] = See Sources and Notes.
Market Value of Long-Term Debt	$48,203	$48,203	$48,753	$44,501	$27,747	$24,644	$24,310	[s] = [q] + [r].
Market Value of Debt	$48,203	$48,203	$48,753	$44,501	$27,747	$24,644	$24,310	[t] = [s].
MARKET VALUE OF FIRM	$95,095	$92,289	$99,033	$96,523	$67,882	$64,992	$62,061	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	48.97%	47.42%	49.94%	53.14%	58.05%	60.34%	59.01%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	0.34%	0.35%	0.83%	0.75%	1.07%	1.74%	1.82%	[w] = [i] / [u].
Debt - Market Value Ratio	50.69%	52.23%	49.23%	46.10%	40.88%	37.92%	39.17%	[x] = [t] / [u].

Sources and Notes:
Bloomberg as of November 30, 2018
Capital structure from 3rd Quarter, 2018 calculated using respective balance sheet information and 15-day average prices ending at period end.
The DCF Capital structure is calculated using 3rd Quarter, 2018 balance sheet information and a 15-trading day average closing price ending on 11/30/2018.
Prices are reported in Supporting Schedule #1 to Table No. BV-6.
[o] =
(1): 0 if [m] > 0.
(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].
(3): [n] if [m] < 0 and |[m]| > [n].
[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2017 10-K.

Table No. BV-3

Market Value of the Electric Proxy Group

Panel S: Unitil Corp.

($MM)

	DCF Capital Structure	3rd Quarter, 2018	3rd Quarter, 2017	3rd Quarter, 2016	3rd Quarter, 2015	3rd Quarter, 2014	3rd Quarter, 2013	Notes
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	$345	$345	$298	$287	$278	$268	$254	[a]
Shares Outstanding (in millions) - Common	15	15	14	14	14	14	14	[b]
Price per Share - Common	$50	$51	$50	$39	$36	$32	$29	[c]
Market Value of Common Equity	$743	$763	$699	$552	$499	$439	$400	[d] = [b] x [c].
Market Value of GP Equity	n/a	n/a	n/a	n/a	n/a	n/a	n/a	[e]
Total Market Value of Equity	$743	$763	$699	$552	$499	$439	$400	[f]= [d]
Market to Book Value of Common Equity	2.16	2.21	2.35	1.92	1.80	1.64	1.58	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	$0	$0	$0	$0	$0	$0	$0	[h]
Market Value of Preferred Equity	$0	$0	$0	$0	$0	$0	$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	$121	$121	$122	$108	$107	$112	$112	[j]
Current Liabilities	$181	$181	$216	$126	$101	$76	$116	[k]
Current Portion of Long-Term Debt	$35	$35	$33	$20	$4	$3	$1	[l]
Net Working Capital	($25)	($25)	($61)	$1	$10	$39	($3)	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	$69	$69	$112	$37	$4	$1	$44	[n]
Adjusted Short-Term Debt	$25	$25	$61	$0	$0	$0	$3	[o] = See Sources and Notes.
Long-Term Debt	$365	$365	$310	$344	$338	$333	$287	[p]
Book Value of Long-Term Debt	$424	$424	$404	$364	$342	$336	$291	[q] = [l] + [o] + [p].
Adjustment to Book Value of Long-Term Debt	$81	$81	$54	$40	$52	$43	$62	[r] = See Sources and Notes.
Market Value of Long-Term Debt	$505	$505	$458	$404	$394	$378	$353	[s] = [q] + [r].
Market Value of Debt	$505	$505	$458	$404	$394	$378	$353	[t] = [s].
MARKET VALUE OF FIRM	$1,249	$1,269	$1,157	$956	$893	$817	$754	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	59.52%	60.16%	60.42%	57.74%	55.88%	53.69%	53.11%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.03%	[w] = [i] / [u].
Debt - Market Value Ratio	40.46%	39.82%	39.56%	42.24%	44.09%	46.28%	46.86%	[x] = [t] / [u].

Sources and Notes:
Bloomberg as of November 30, 2018
Capital structure from 3rd Quarter, 2018 calculated using respective balance sheet information and 15-day average prices ending at period end.
The DCF Capital structure is calculated using 3rd Quarter, 2018 balance sheet information and a 15-trading day average closing price ending on 11/30/2018.
Prices are reported in Supporting Schedule #1 to Table No. BV-6.
[o] =
(1): 0 if [m] > 0.
(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].
(3): [n] if [m] < 0 and |[m]| > [n].
[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2017 10-K.

Table No. BV-3

Market Value of the Electric Proxy Group

Panel T: Edison Int'l

($MM)

	DCF Capital Structure	3rd Quarter, 2018	3rd Quarter, 2017	3rd Quarter, 2016	3rd Quarter, 2015	3rd Quarter, 2014	3rd Quarter, 2013	Notes
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	$12,096	$12,096	$12,416	$11,814	$11,600	$10,736	$9,689	[a]
Shares Outstanding (in millions) - Common	326	326	326	326	326	326	326	[b]
Price per Share - Common	$54	$68	$80	$74	$61	$57	$46	[c]
Market Value of Common Equity	$17,664	$22,051	$25,912	$23,951	$19,740	$18,584	$14,938	[d] = [b] x [c].
Market Value of GP Equity	n/a	n/a	n/a	n/a	n/a	n/a	n/a	[e]
Total Market Value of Equity	$17,664	$22,051	$25,912	$23,951	$19,740	$18,584	$14,938	[f]= [d]
Market to Book Value of Common Equity	1.46	1.82	2.09	2.03	1.70	1.73	1.54	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	$2,193	$2,193	$2,194	$2,191	$2,020	$2,022	$1,753	[h]
Market Value of Preferred Equity	$2,193	$2,193	$2,194	$2,191	$2,020	$2,022	$1,753	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	$3,383	$3,383	$2,758	$2,605	$3,792	$4,498	$3,603	[j]
Current Liabilities	$4,719	$4,719	$5,409	$5,342	$5,239	$5,849	$5,389	[k]
Current Portion of Long-Term Debt	$79	$79	$583	$881	$295	$704	$401	[l]
Net Working Capital	($1,257)	($1,257)	($2,068)	($1,856)	($1,152)	($647)	($1,385)	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	$103	$103	$908	$757	$1,154	$1,349	$1,528	[n]
Adjusted Short-Term Debt	$103	$103	$908	$757	$1,152	$647	$1,385	[o] = See Sources and Notes.
Long-Term Debt	$14,629	$14,629	$11,638	$10,407	$10,957	$10,133	$9,232	[p]
Book Value of Long-Term Debt	$14,811	$14,811	$13,129	$12,045	$12,404	$11,484	$11,018	[q] = [l] + [o] + [p].
Adjustment to Book Value of Long-Term Debt	$1,637	$1,637	$1,212	$993	$1,581	$658	$1,713	[r] = See Sources and Notes.
Market Value of Long-Term Debt	$16,448	$16,448	$14,341	$13,038	$13,985	$12,142	$12,731	[s] = [q] + [r].
Market Value of Debt	$16,448	$16,448	$14,341	$13,038	$13,985	$12,142	$12,731	[t] = [s].
MARKET VALUE OF FIRM	$36,305	$40,692	$42,447	$39,180	$35,745	$32,748	$29,422	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	48.65%	54.19%	61.05%	61.13%	55.22%	56.75%	50.77%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	6.04%	5.39%	5.17%	5.59%	5.65%	6.17%	5.96%	[w] = [i] / [u].
Debt - Market Value Ratio	45.30%	40.42%	33.79%	33.28%	39.12%	37.08%	43.27%	[x] = [t] / [u].

Sources and Notes:
Bloomberg as of November 30, 2018
Capital structure from 3rd Quarter, 2018 calculated using respective balance sheet information and 15-day average prices ending at period end.
The DCF Capital structure is calculated using 3rd Quarter, 2018 balance sheet information and a 15-trading day average closing price ending on 11/30/2018.
Prices are reported in Supporting Schedule #1 to Table No. BV-6.
[o] =
(1): 0 if [m] > 0.
(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].
(3): [n] if [m] < 0 and |[m]| > [n].
[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2017 10-K.

Table No. BV-3

Market Value of the Electric Proxy Group

Panel U: El Paso Electric

($MM)

	DCF Capital Structure	3rd Quarter, 2018	3rd Quarter, 2017	3rd Quarter, 2016	3rd Quarter, 2015	3rd Quarter, 2014	3rd Quarter, 2013	Notes
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	$1,197	$1,197	$1,136	$1,075	$1,021	$1,016	$894	[a]
Shares Outstanding (in millions) - Common	41	41	40	40	40	40	40	[b]
Price per Share - Common	$56	$60	$55	$47	$36	$37	$33	[c]
Market Value of Common Equity	$2,289	$2,418	$2,230	$1,886	$1,432	$1,481	$1,328	[d] = [b] x [c].
Market Value of GP Equity	n/a	n/a	n/a	n/a	n/a	n/a	n/a	[e]
Total Market Value of Equity	$2,289	$2,418	$2,230	$1,886	$1,432	$1,481	$1,328	[f]= [d]
Market to Book Value of Common Equity	1.91	2.02	1.96	1.75	1.40	1.46	1.49	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	$0	$0	$0	$0	$0	$0	$0	[h]
Market Value of Preferred Equity	$0	$0	$0	$0	$0	$0	$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	$201	$201	$199	$192	$202	$207	$237	[j]
Current Liabilities	$204	$204	$316	$294	$251	$242	$141	[k]
Current Portion of Long-Term Debt	$0	$0	$83	$83	$0	$15	$0	[l]
Net Working Capital	($3)	($3)	($34)	($19)	($48)	($19)	$96	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	$19	$19	$168	$55	$119	$90	$15	[n]
Adjusted Short-Term Debt	$3	$3	$34	$19	$48	$19	$0	[o] = See Sources and Notes.
Long-Term Debt	$1,385	$1,385	$1,196	$1,195	$1,134	$985	$1,000	[p]
Book Value of Long-Term Debt	$1,388	$1,388	$1,313	$1,297	$1,182	$1,019	$1,000	[q] = [l] + [o] + [p].
Adjustment to Book Value of Long-Term Debt	$232	$232	$139	$9	$150	$45	$160	[r] = See Sources and Notes.
Market Value of Long-Term Debt	$1,621	$1,621	$1,452	$1,306	$1,332	$1,064	$1,160	[s] = [q] + [r].
Market Value of Debt	$1,621	$1,621	$1,452	$1,306	$1,332	$1,064	$1,160	[t] = [s].
MARKET VALUE OF FIRM	$3,909	$4,039	$3,682	$3,192	$2,764	$2,544	$2,487	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	58.54%	59.87%	60.56%	59.09%	51.80%	58.19%	53.38%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	41.46%	40.13%	39.44%	40.91%	48.20%	41.81%	46.62%	[x] = [t] / [u].

Sources and Notes:
Bloomberg as of November 30, 2018
Capital structure from 3rd Quarter, 2018 calculated using respective balance sheet information and 15-day average prices ending at period end.
The DCF Capital structure is calculated using 3rd Quarter, 2018 balance sheet information and a 15-trading day average closing price ending on 11/30/2018.
Prices are reported in Supporting Schedule #1 to Table No. BV-6.
[o] =
(1): 0 if [m] > 0.
(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].
(3): [n] if [m] < 0 and |[m]| > [n].
[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2017 10-K.

Table No. BV-3

Market Value of the Electric Proxy Group

Panel V: IDACORP Inc.

($MM)

	DCF Capital Structure	3rd Quarter, 2018	3rd Quarter, 2017	3rd Quarter, 2016	3rd Quarter, 2015	3rd Quarter, 2014	3rd Quarter, 2013	Notes
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	$2,368	$2,368	$2,248	$2,149	$2,050	$1,949	$1,860	[a]
Shares Outstanding (in millions) - Common	50	50	50	50	50	50	50	[b]
Price per Share - Common	$99	$99	$89	$79	$61	$55	$48	[c]
Market Value of Common Equity	$4,977	$5,003	$4,490	$3,961	$3,087	$2,753	$2,403	[d] = [b] x [c].
Market Value of GP Equity	n/a	n/a	n/a	n/a	n/a	n/a	n/a	[e]
Total Market Value of Equity	$4,977	$5,003	$4,490	$3,961	$3,087	$2,753	$2,403	[f]= [d]
Market to Book Value of Common Equity	2.10	2.11	2.00	1.84	1.51	1.41	1.29	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	$0	$0	$0	$0	$0	$0	$0	[h]
Market Value of Preferred Equity	$0	$0	$0	$0	$0	$0	$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	$583	$583	$458	$460	$494	$475	$567	[j]
Current Liabilities	$250	$250	$226	$205	$205	$240	$335	[k]
Current Portion of Long-Term Debt	$0	$0	$0	$1	$1	$1	$71	[l]
Net Working Capital	$332	$332	$232	$256	$290	$237	$303	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	$0	$0	$2	$5	$4	$32	$53	[n]
Adjusted Short-Term Debt	$0	$0	$0	$0	$0	$0	$0	[o] = See Sources and Notes.
Long-Term Debt	$1,834	$1,834	$1,746	$1,746	$1,742	$1,614	$1,615	[p]
Book Value of Long-Term Debt	$1,834	$1,834	$1,746	$1,747	$1,743	$1,615	$1,686	[q] = [l] + [o] + [p].
Adjustment to Book Value of Long-Term Debt	$169	$169	$113	$87	$173	($16)	$282	[r] = See Sources and Notes.
Market Value of Long-Term Debt	$2,004	$2,004	$1,859	$1,833	$1,916	$1,599	$1,968	[s] = [q] + [r].
Market Value of Debt	$2,004	$2,004	$1,859	$1,833	$1,916	$1,599	$1,968	[t] = [s].
MARKET VALUE OF FIRM	$6,981	$7,007	$6,348	$5,795	$5,003	$4,353	$4,370	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	71.30%	71.40%	70.72%	68.36%	61.71%	63.26%	54.97%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	28.70%	28.60%	29.28%	31.64%	38.29%	36.74%	45.03%	[x] = [t] / [u].

Sources and Notes:
Bloomberg as of November 30, 2018
Capital structure from 3rd Quarter, 2018 calculated using respective balance sheet information and 15-day average prices ending at period end.
The DCF Capital structure is calculated using 3rd Quarter, 2018 balance sheet information and a 15-trading day average closing price ending on 11/30/2018.
Prices are reported in Supporting Schedule #1 to Table No. BV-6.
[o] =
(1): 0 if [m] > 0.
(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].
(3): [n] if [m] < 0 and |[m]| > [n].
[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2017 10-K.

Table No. BV-3

Market Value of the Electric Proxy Group

Panel W: Pinnacle West Capital

($MM)

	DCF Capital Structure	3rd Quarter, 2018	3rd Quarter, 2017	3rd Quarter, 2016	3rd Quarter, 2015	3rd Quarter, 2014	3rd Quarter, 2013	Notes
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	$5,354	$5,354	$5,142	$4,853	$4,654	$4,492	$4,276	[a]
Shares Outstanding (in millions) - Common	112	112	112	111	111	110	110	[b]
Price per Share - Common	$89	$80	$87	$77	$62	$56	$55	[c]
Market Value of Common Equity	$9,935	$8,907	$9,757	$8,563	$6,850	$6,196	$6,003	[d] = [b] x [c].
Market Value of GP Equity	n/a	n/a	n/a	n/a	n/a	n/a	n/a	[e]
Total Market Value of Equity	$9,935	$8,907	$9,757	$8,563	$6,850	$6,196	$6,003	[f]= [d]
Market to Book Value of Common Equity	1.86	1.66	1.90	1.76	1.47	1.38	1.40	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	$0	$0	$0	$0	$0	$0	$0	[h]
Market Value of Preferred Equity	$0	$0	$0	$0	$0	$0	$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	$1,207	$1,207	$1,174	$977	$1,062	$1,041	$1,350	[j]
Current Liabilities	$1,735	$1,735	$1,303	$1,110	$1,523	$1,449	$1,447	[k]
Current Portion of Long-Term Debt	$600	$600	$207	$17	$411	$369	$566	[l]
Net Working Capital	$72	$72	$78	($115)	($50)	($39)	$470	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	$128	$128	$131	$117	$57	$19	$0	[n]
Adjusted Short-Term Debt	$0	$0	$0	$115	$50	$19	$0	[o] = See Sources and Notes.
Long-Term Debt	$4,487	$4,487	$4,491	$4,145	$3,257	$3,038	$2,820	[p]
Book Value of Long-Term Debt	$5,087	$5,087	$4,698	$4,278	$3,719	$3,426	$3,387	[q] = [l] + [o] + [p].
Adjustment to Book Value of Long-Term Debt	$433	$433	$279	$286	$424	$242	$553	[r] = See Sources and Notes.
Market Value of Long-Term Debt	$5,521	$5,521	$4,977	$4,564	$4,143	$3,668	$3,940	[s] = [q] + [r].
Market Value of Debt	$5,521	$5,521	$4,977	$4,564	$4,143	$3,668	$3,940	[t] = [s].
MARKET VALUE OF FIRM								
	$15,455	$14,427	$14,734	$13,127	$10,993	$9,864	$9,943	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	64.28%	61.73%	66.22%	65.23%	62.31%	62.81%	60.38%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	35.72%	38.27%	33.78%	34.77%	37.69%	37.19%	39.62%	[x] = [t] / [u].

Sources and Notes:
Bloomberg as of November 30, 2018
Capital structure from 3rd Quarter, 2018 calculated using respective balance sheet information and 15-day average prices ending at period end.
The DCF Capital structure is calculated using 3rd Quarter, 2018 balance sheet information and a 15-trading day average closing price ending on 11/30/2018.
Prices are reported in Supporting Schedule #1 to Table No. BV-6.
[o] =
(1): 0 if [m] > 0.
(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].
(3): [n] if [m] < 0 and |[m]| > [n].
[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2017 10-K.

Table No. BV-3

Market Value of the Electric Proxy Group

Panel X: PNM Resources

($MM)

	DCF Capital Structure	3rd Quarter, 2018	3rd Quarter, 2017	3rd Quarter, 2016	3rd Quarter, 2015	3rd Quarter, 2014	3rd Quarter, 2013	Notes
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	$1,771	$1,771	$1,766	$1,688	$1,763	$1,723	$1,665	[a]
Shares Outstanding (in millions) - Common	80	80	80	80	80	80	80	[b]
Price per Share - Common	$42	$39	$42	$33	$26	$26	$22	[c]
Market Value of Common Equity	$3,352	$3,135	$3,317	$2,640	$2,094	$2,053	$1,766	[d] = [b] x [c].
Market Value of GP Equity	n/a	n/a	n/a	n/a	n/a	n/a	n/a	[e]
Total Market Value of Equity	$3,352	$3,135	$3,317	$2,640	$2,094	$2,053	$1,766	[f]= [d]
Market to Book Value of Common Equity	1.89	1.77	1.88	1.56	1.19	1.19	1.06	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	$12	$12	$12	$12	$12	$12	$12	[h]
Market Value of Preferred Equity	$12	$12	$12	$12	$12	$12	$12	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	$364	$364	$375	$399	$408	$466	$401	[j]
Current Liabilities	$980	$980	$711	$702	$519	$700	$416	[k]
Current Portion of Long-Term Debt	$472	$472	$165	$101	$125	$333	$53	[l]
Net Working Capital	($145)	($145)	($171)	($202)	$14	$99	$37	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	$263	$263	$267	$356	$103	$100	$112	[n]
Adjusted Short-Term Debt	$145	$145	$171	$202	$0	$0	$0	[o] = See Sources and Notes.
Long-Term Debt	$2,143	$2,143	$2,282	$2,207	$1,980	$1,542	$1,696	[p]
Book Value of Long-Term Debt	$2,759	$2,759	$2,619	$2,510	$2,105	$1,875	$1,749	[q] = [l] + [o] + [p].
Adjustment to Book Value of Long-Term Debt	$69	$69	$99	$123	$142	$92	$170	[r] = See Sources and Notes.
Market Value of Long-Term Debt	$2,828	$2,828	$2,718	$2,632	$2,247	$1,967	$1,919	[s] = [q] + [r].
Market Value of Debt	$2,828	$2,828	$2,718	$2,632	$2,247	$1,967	$1,919	[t] = [s].
MARKET VALUE OF FIRM	$6,192	$5,975	$6,046	$5,284	$4,353	$4,032	$3,697	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	54.14%	52.47%	54.86%	49.97%	48.11%	50.91%	47.78%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	0.19%	0.19%	0.19%	0.22%	0.26%	0.29%	0.31%	[w] = [i] / [u].
Debt - Market Value Ratio	45.68%	47.34%	44.95%	49.82%	51.62%	48.80%	51.90%	[x] = [t] / [u].

Sources and Notes:
Bloomberg as of November 30, 2018
Capital structure from 3rd Quarter, 2018 calculated using respective balance sheet information and 15-day average prices ending at period end.
The DCF Capital structure is calculated using 3rd Quarter, 2018 balance sheet information and a 15-trading day average closing price ending on 11/30/2018.
Prices are reported in Supporting Schedule #1 to Table No. BV-6.
[o] =
(1): 0 if [m] > 0.
(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].
(3): [n] if [m] < 0 and |[m]| > [n].
[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2017 10-K.

Table No. BV-3

Market Value of the Electric Proxy Group

Panel Y: Portland General

($MM)

	DCF Capital Structure	3rd Quarter, 2018	3rd Quarter, 2017	3rd Quarter, 2016	3rd Quarter, 2015	3rd Quarter, 2014	3rd Quarter, 2013	Notes
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	$2,486	$2,486	$2,402	$2,310	$2,232	$1,889	$1,792	[a]
Shares Outstanding (in millions) - Common	89	89	89	89	89	78	78	[b]
Price per Share - Common	$48	$46	$46	$43	$36	$33	$28	[c]
Market Value of Common Equity	$4,259	$4,113	$4,140	$3,833	$3,155	$2,567	$2,212	[d] = [b] x [c].
Market Value of GP Equity	n/a	n/a	n/a	n/a	n/a	n/a	n/a	[e]
Total Market Value of Equity	$4,259	$4,113	$4,140	$3,833	$3,155	$2,567	$2,212	[f]= [d]
Market to Book Value of Common Equity	1.71	1.65	1.72	1.66	1.41	1.36	1.23	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	$0	$0	$0	$0	$0	$0	$0	[h]
Market Value of Preferred Equity	$0	$0	$0	$0	$0	$0	$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	$631	$631	$466	$476	$605	$542	$565	[j]
Current Liabilities	$703	$703	$491	$448	$465	$482	$380	[k]
Current Portion of Long-Term Debt	$300	$300	$100	$0	$0	$70	$50	[l]
Net Working Capital	$228	$228	$75	$28	$140	$130	$235	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	$0	$0	$0	$0	$0	$0	$0	[n]
Adjusted Short-Term Debt	$0	$0	$0	$0	$0	$0	$0	[o] = See Sources and Notes.
Long-Term Debt	$2,127	$2,127	$2,277	$2,325	$2,204	$2,251	$1,761	[p]
Book Value of Long-Term Debt	$2,427	$2,427	$2,377	$2,325	$2,204	$2,321	$1,811	[q] = [l] + [o] + [p].
Adjustment to Book Value of Long-Term Debt	$403	$403	$343	$251	$400	$158	$313	[r] = See Sources and Notes.
Market Value of Long-Term Debt	$2,830	$2,830	$2,720	$2,576	$2,604	$2,479	$2,124	[s] = [q] + [r].
Market Value of Debt	$2,830	$2,830	$2,720	$2,576	$2,604	$2,479	$2,124	[t] = [s].
MARKET VALUE OF FIRM	$7,089	$6,943	$6,860	$6,409	$5,759	$5,046	$4,336	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	60.08%	59.24%	60.35%	59.81%	54.79%	50.87%	51.02%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	39.92%	40.76%	39.65%	40.19%	45.21%	49.13%	48.98%	[x] = [t] / [u].

Sources and Notes:
Bloomberg as of November 30, 2018
Capital structure from 3rd Quarter, 2018 calculated using respective balance sheet information and 15-day average prices ending at period end.
The DCF Capital structure is calculated using 3rd Quarter, 2018 balance sheet information and a 15-trading day average closing price ending on 11/30/2018.
Prices are reported in Supporting Schedule #1 to Table No. BV-6.
[o] =
(1): 0 if [m] > 0.
(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].
(3): [n] if [m] < 0 and |[m]| > [n].
[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2017 10-K.

Table No. BV-3

Market Value of the Electric Proxy Group

Panel Z: Xcel Energy Inc.

($MM)

	DCF Capital Structure	3rd Quarter, 2018	3rd Quarter, 2017	3rd Quarter, 2016	3rd Quarter, 2015	3rd Quarter, 2014	3rd Quarter, 2013	Notes
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	$12,165	$12,165	$11,439	$10,988	$10,545	$10,155	$9,547	[a]
Shares Outstanding (in millions) - Common	513	513	508	508	507	505	498	[b]
Price per Share - Common	$51	$48	$48	$42	$34	$31	$28	[c]
Market Value of Common Equity	$26,344	$24,475	$24,546	$21,223	$17,219	$15,664	$13,799	[d] = [b] x [c].
Market Value of GP Equity	n/a	n/a	n/a	n/a	n/a	n/a	n/a	[e]
Total Market Value of Equity	$26,344	$24,475	$24,546	$21,223	$17,219	$15,664	$13,799	[f]= [d]
Market to Book Value of Common Equity	2.17	2.01	2.15	1.93	1.63	1.54	1.45	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	$0	$0	$0	$0	$0	$0	$0	[h]
Market Value of Preferred Equity	$0	$0	$0	$0	$0	$0	$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	$3,003	$3,003	$2,899	$3,076	$3,344	$3,197	$3,121	[j]
Current Liabilities	$3,838	$3,838	$3,340	$3,454	$3,085	$3,471	$2,839	[k]
Current Portion of Long-Term Debt	$556	$556	$305	$710	$457	$258	$281	[l]
Net Working Capital	($279)	($279)	($136)	$332	$717	($17)	$562	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	$437	$437	$514	$366	$64	$697	$302	[n]
Adjusted Short-Term Debt	$279	$279	$136	$0	$0	$17	$0	[o] = See Sources and Notes.
Long-Term Debt	$15,508	$15,508	$14,573	$13,403	$12,691	$11,502	$10,914	[p]
Book Value of Long-Term Debt	$16,343	$16,343	$15,014	$14,112	$13,148	$11,776	$11,195	[q] = [l] + [o] + [p].
Adjustment to Book Value of Long-Term Debt	$1,555	$1,555	$1,063	$947	$1,603	$687	$1,806	[r] = See Sources and Notes.
Market Value of Long-Term Debt	$17,898	$17,898	$16,077	$15,059	$14,751	$12,463	$13,001	[s] = [q] + [r].
Market Value of Debt	$17,898	$17,898	$16,077	$15,059	$14,751	$12,463	$13,001	[t] = [s].
MARKET VALUE OF FIRM	$44,242	$42,373	$40,624	$36,282	$31,970	$28,128	$26,800	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	59.55%	57.76%	60.42%	58.49%	53.86%	55.69%	51.49%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	40.45%	42.24%	39.58%	41.51%	46.14%	44.31%	48.51%	[x] = [t] / [u].

Sources and Notes:
Bloomberg as of November 30, 2018
Capital structure from 3rd Quarter, 2018 calculated using respective balance sheet information and 15-day average prices ending at period end.
The DCF Capital structure is calculated using 3rd Quarter, 2018 balance sheet information and a 15-trading day average closing price ending on 11/30/2018.
Prices are reported in Supporting Schedule #1 to Table No. BV-6.
[o] =
(1): 0 if [m] > 0.
(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].
(3): [n] if [m] < 0 and |[m]| > [n].
[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2017 10-K.

Table No. BV-4

Capital Structure Summary

Company	DCF Capital Structure			5-Year Average Capital Structure		
	Common Equity - Value Ratio [1]	Preferred Equity - Value Ratio [2]	Debt - Value Ratio [3]	Common Equity - Value Ratio [4]	Preferred Equity - Value Ratio [5]	Debt - Value Ratio [6]
ALLETE	71.4%	0.0%	28.6%	64.0%	0.0%	36.0%
Alliant Energy	61.1%	2.3%	36.6%	60.9%	1.7%	37.3%
Amer. Elec. Power	58.2%	0.0%	41.8%	56.8%	0.0%	43.2%
Ameren Corp.	64.6%	0.0%	35.4%	59.6%	0.0%	40.4%
CMS Energy Corp.	55.9%	0.0%	44.1%	50.9%	0.0%	49.1%
DTE Energy	59.6%	0.0%	40.4%	60.0%	0.0%	40.0%
Entergy Corp.	45.9%	0.6%	53.5%	47.8%	0.9%	51.4%
MGE Energy	80.2%	0.0%	19.8%	78.8%	0.0%	21.2%
OGE Energy	68.8%	0.0%	31.2%	69.6%	0.0%	30.4%
Otter Tail Corp.	74.7%	0.0%	25.3%	68.5%	0.0%	31.5%
AVANGRID Inc.	69.8%	0.0%	30.2%	70.2%	0.0%	29.8%
Consol. Edison	55.4%	0.0%	44.6%	58.0%	0.0%	42.0%
Duke Energy	51.7%	0.0%	48.3%	52.6%	0.0%	47.4%
Eversource Energy	59.6%	0.4%	39.9%	60.6%	0.6%	38.8%
NextEra Energy	71.6%	0.0%	28.4%	61.6%	0.0%	38.4%
PPL Corp.	46.9%	0.0%	53.1%	48.9%	0.0%	51.1%
Public Serv. Enterprise	64.0%	0.0%	36.0%	64.9%	0.0%	35.1%
Southern Co.	49.0%	0.3%	50.7%	54.9%	1.1%	44.0%
Unitil Corp.	59.5%	0.0%	40.5%	56.9%	0.0%	43.1%
Edison Int'l	48.7%	6.0%	45.3%	57.3%	5.7%	37.0%
El Paso Electric	58.5%	0.0%	41.5%	57.3%	0.0%	42.7%
IDACORP Inc.	71.3%	0.0%	28.7%	65.4%	0.0%	34.6%
Pinnacle West Capital	64.3%	0.0%	35.7%	63.5%	0.0%	36.5%
PNM Resources	54.1%	0.2%	45.7%	50.8%	0.2%	49.0%
Portland General	60.1%	0.0%	39.9%	56.2%	0.0%	43.8%
Xcel Energy Inc.	59.5%	0.0%	40.5%	56.6%	0.0%	43.4%
Average	60.9%	0.4%	38.7%	59.7%	0.4%	39.9%

Sources and Notes:
[1], [4]: Supporting Schedule #1 to Table No. BV-4.
[2], [5]: Supporting Schedule #2 to Table No. BV-4.
[3], [6]: Supporting Schedule #3 to Table No. BV-4.
Values in this table may not add up exactly to 100% because of rounding.

Supporting Schedule #1 to Table No. BV-4

Calculation of the Average Common Equity - Market Value Ratio

Company	DCF Capital Structure [1]	3rd Quarter, 2018 [2]	3rd Quarter, 2017 [3]	3rd Quarter, 2016 [4]	3rd Quarter, 2015 [5]	3rd Quarter, 2014 [6]	3rd Quarter, 2013 [7]	5-Year Average [8]
ALLETE	71.4%	70.4%	71.3%	65.0%	58.3%	59.5%	61.3%	64.0%
Alliant Energy	61.1%	60.2%	63.9%	64.2%	57.9%	60.2%	56.7%	60.9%
Amer. Elec. Power	58.2%	56.6%	60.1%	60.0%	54.6%	56.0%	50.5%	56.8%
Ameren Corp.	64.6%	63.2%	63.0%	60.7%	57.0%	58.7%	53.9%	59.6%
CMS Energy Corp.	55.9%	55.1%	55.8%	53.6%	49.6%	46.0%	44.1%	50.9%
DTE Energy	59.6%	57.9%	61.1%	62.7%	57.7%	61.1%	57.2%	60.0%
Entergy Corp.	45.9%	44.9%	48.0%	48.3%	45.2%	51.5%	46.6%	47.8%
MGE Energy	80.2%	80.5%	84.0%	82.2%	75.5%	75.8%	72.6%	78.8%
OGE Energy	68.8%	67.5%	68.1%	71.8%	67.9%	71.5%	69.4%	69.6%
Otter Tail Corp.	74.7%	74.8%	75.5%	69.3%	61.8%	65.2%	66.5%	68.5%
AVANGRID Inc.	69.8%	69.4%	69.6%	72.1%	n/a	n/a	n/a	70.2%
Consol. Edison	55.4%	55.4%	60.5%	60.4%	57.0%	57.2%	55.0%	58.0%
Duke Energy	51.7%	49.8%	53.0%	52.6%	51.7%	55.3%	51.6%	52.6%
Eversource Energy	59.6%	58.0%	62.1%	63.1%	59.8%	60.5%	57.3%	60.6%
NextEra Energy	71.6%	70.7%	65.8%	63.7%	58.5%	58.1%	53.6%	61.6%
PPL Corp.	46.9%	45.7%	52.9%	51.8%	47.8%	47.5%	43.2%	48.9%
Public Serv. Enterprise	64.0%	63.3%	63.9%	64.1%	66.5%	66.9%	62.9%	64.9%
Southern Co.	49.0%	47.4%	49.9%	53.1%	58.1%	60.3%	59.0%	54.9%
Unitil Corp.	59.5%	60.2%	60.4%	57.7%	55.9%	53.7%	53.1%	56.9%
Edison Int'l	48.7%	54.2%	61.0%	61.1%	55.2%	56.7%	50.8%	57.3%
El Paso Electric	58.5%	59.9%	60.6%	59.1%	51.8%	58.2%	53.4%	57.3%
IDACORP Inc.	71.3%	71.4%	70.7%	68.4%	61.7%	63.3%	55.0%	65.4%
Pinnacle West Capital	64.3%	61.7%	66.2%	65.2%	62.3%	62.8%	60.4%	63.5%
PNM Resources	54.1%	52.5%	54.9%	50.0%	48.1%	50.9%	47.8%	50.8%
Portland General	60.1%	59.2%	60.4%	59.8%	54.8%	50.9%	51.0%	56.2%
Xcel Energy Inc.	59.5%	57.8%	60.4%	58.5%	53.9%	55.7%	51.5%	56.6%

Sources and Notes:
[1] - [7]: Table No. BV-3; Panels A - Z, [v].
[8]: Average of [2] - [7] with 1/2 weighting to 3Q2018 and 3Q2013 for the purposes of calculating average capital structure during the period.
[1]: Reflects the current capital structure.
Avangrid average reflects available data.

Supporting Schedule #2 to Table No. BV-4

Calculation of the Average Preferred Equity - Market Value Ratio

Company	DCF Capital Structure [1]	3rd Quarter, 2018 [2]	3rd Quarter, 2017 [3]	3rd Quarter, 2016 [4]	3rd Quarter, 2015 [5]	3rd Quarter, 2014 [6]	3rd Quarter, 2013 [7]	5-Year Average [8]
ALLETE	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Alliant Energy	2.3%	2.4%	1.3%	1.5%	1.8%	1.9%	2.1%	1.7%
Amer. Elec. Power	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Ameren Corp.	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CMS Energy Corp.	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
DTE Energy	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Entergy Corp.	0.6%	0.6%	0.7%	0.8%	0.8%	1.1%	1.2%	0.9%
MGE Energy	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
OGE Energy	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Otter Tail Corp.	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
AVANGRID Inc.	0.0%	0.0%	0.0%	0.0%	n/a	n/a	n/a	0.0%
Consol. Edison	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Duke Energy	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Eversource Energy	0.4%	0.5%	0.5%	0.6%	0.6%	0.7%	0.7%	0.6%
NextEra Energy	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
PPL Corp.	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Public Serv. Enterprise	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Southern Co.	0.3%	0.4%	0.8%	0.8%	1.1%	1.7%	1.8%	1.1%
Unitil Corp.	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Edison Int'l	6.0%	5.4%	5.2%	5.6%	5.7%	6.2%	6.0%	5.7%
El Paso Electric	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
IDACORP Inc.	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Pinnacle West Capital	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
PNM Resources	0.2%	0.2%	0.2%	0.2%	0.3%	0.3%	0.3%	0.2%
Portland General	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Xcel Energy Inc.	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Sources and Notes:
[1] - [7]: Table No. BV-3; Panels A - Z, [w].
[8]: Average of [2] - [7] with 1/2 weighting to 3Q2018 and 3Q2013 for the purposes of calculating average capital structure during the period.
[1]: Reflects the current capital structure.
Avangrid average reflects available data.

Supporting Schedule #3 to Table No. BV-4

Calculation of the Average Debt - Market Value Ratio

Company	DCF Capital Structure [1]	3rd Quarter, 2018 [2]	3rd Quarter, 2017 [3]	3rd Quarter, 2016 [4]	3rd Quarter, 2015 [5]	3rd Quarter, 2014 [6]	3rd Quarter, 2013 [7]	5-Year Average [8]
ALLETE	28.6%	29.6%	28.7%	35.0%	41.7%	40.5%	38.7%	36.0%
Alliant Energy	36.6%	37.5%	34.8%	34.3%	40.3%	37.9%	41.3%	37.3%
Amer. Elec. Power	41.8%	43.4%	39.9%	40.0%	45.4%	44.0%	49.5%	43.2%
Ameren Corp.	35.4%	36.8%	37.0%	39.3%	43.0%	41.3%	46.1%	40.4%
CMS Energy Corp.	44.1%	44.9%	44.2%	46.4%	50.4%	54.0%	55.9%	49.1%
DTE Energy	40.4%	42.1%	38.9%	37.3%	42.3%	38.9%	42.8%	40.0%
Entergy Corp.	53.5%	54.5%	51.3%	50.9%	53.9%	47.3%	52.2%	51.4%
MGE Energy	19.8%	19.5%	16.0%	17.8%	24.5%	24.2%	27.4%	21.2%
OGE Energy	31.2%	32.5%	31.9%	28.2%	32.1%	28.5%	30.6%	30.4%
Otter Tail Corp.	25.3%	25.2%	24.5%	30.7%	38.2%	34.8%	33.5%	31.5%
AVANGRID Inc.	30.2%	30.6%	30.4%	27.9%	n/a	n/a	n/a	29.8%
Consol. Edison	44.6%	44.6%	39.5%	39.6%	43.0%	42.8%	45.0%	42.0%
Duke Energy	48.3%	50.2%	47.0%	47.4%	48.3%	44.7%	48.4%	47.4%
Eversource Energy	39.9%	41.6%	37.4%	36.3%	39.6%	38.8%	42.0%	38.8%
NextEra Energy	28.4%	29.3%	34.2%	36.3%	41.5%	41.9%	46.4%	38.4%
PPL Corp.	53.1%	54.3%	47.1%	48.2%	52.2%	52.5%	56.8%	51.1%
Public Serv. Enterprise	36.0%	36.7%	36.1%	35.9%	33.5%	33.1%	37.1%	35.1%
Southern Co.	50.7%	52.2%	49.2%	46.1%	40.9%	37.9%	39.2%	44.0%
Unitil Corp.	40.5%	39.8%	39.6%	42.2%	44.1%	46.3%	46.9%	43.1%
Edison Int'l	45.3%	40.4%	33.8%	33.3%	39.1%	37.1%	43.3%	37.0%
El Paso Electric	41.5%	40.1%	39.4%	40.9%	48.2%	41.8%	46.6%	42.7%
IDACORP Inc.	28.7%	28.6%	29.3%	31.6%	38.3%	36.7%	45.0%	34.6%
Pinnacle West Capital	35.7%	38.3%	33.8%	34.8%	37.7%	37.2%	39.6%	36.5%
PNM Resources	45.7%	47.3%	44.9%	49.8%	51.6%	48.8%	51.9%	49.0%
Portland General	39.9%	40.8%	39.6%	40.2%	45.2%	49.1%	49.0%	43.8%
Xcel Energy Inc.	40.5%	42.2%	39.6%	41.5%	46.1%	44.3%	48.5%	43.4%

Sources and Notes:
[1] - [7]: Table No. BV-3; Panels A - Z, [x].
[8]: Average of [2] - [7] with 1/2 weighting to 3Q2018 and 3Q2013 for the purposes of calculating average capital structure during the period.
[1]: Reflects the current capital structure.
Avangrid average reflects available data.

Table No. BV-5

Estimated Growth Rates

Company	ThomsonOne IBES Estimate: Long-Term Growth Rate	ThomsonOne IBES Estimate: Number of Estimates	Value Line: EPS Year 2018 Estimate	Value Line: EPS Year 2021-2023 Estimate	Value Line: Annualized Growth Rate	Combined Growth Rate
	[1]	[2]	[3]	[4]	[5]	[6]
ALLETE	n/a	0	$3.40	$4.25	5.7%	5.7%
Alliant Energy	6.9%	1	$2.10	$2.60	5.5%	6.2%
Amer. Elec. Power	5.5%	2	$3.90	$5.00	6.4%	5.8%
Ameren Corp.	7.8%	2	$3.30	$4.00	4.9%	6.8%
CMS Energy Corp.	7.1%	4	$2.35	$3.00	6.3%	6.9%
DTE Energy	5.5%	4	$6.15	$7.75	6.0%	5.6%
Entergy Corp.	-3.9%	2	$4.15	$6.75	12.9%	1.7%
MGE Energy	n/a	0	$2.40	$3.30	8.3%	8.3%
OGE Energy	-0.2%	3	$2.05	$2.50	5.1%	1.1%
Otter Tail Corp.	n/a	0	$2.05	$2.60	6.1%	6.1%
AVANGRID Inc.	9.1%	1	$2.20	$3.25	10.2%	9.7%
Consol. Edison	3.2%	3	$4.20	$4.75	3.1%	3.2%
Duke Energy	4.4%	2	$4.40	$5.50	5.7%	4.9%
Eversource Energy	5.8%	4	$3.25	$4.00	5.3%	5.7%
NextEra Energy	8.4%	3	$7.50	$10.25	8.1%	8.3%
PPL Corp.	4.3%	1	$2.50	$2.75	2.4%	3.4%
Public Serv. Enterprise	7.3%	2	$3.00	$3.75	5.7%	6.7%
Southern Co.	1.4%	3	$2.90	$3.50	4.8%	2.2%
Unitil Corp.	4.0%	2	$0.00	$0.00	n/a	4.0%
Edison Int'l	3.8%	4	$4.35	$5.50	6.0%	4.2%
El Paso Electric	4.7%	1	$2.55	$3.00	4.1%	4.4%
IDACORP Inc.	2.3%	2	$4.30	$4.75	2.5%	2.4%
Pinnacle West Capital	4.1%	3	$4.40	$5.50	5.7%	4.5%
PNM Resources	5.1%	2	$1.90	$2.50	7.1%	5.7%
Portland General	5.1%	2	$2.30	$2.75	4.6%	4.9%
Xcel Energy Inc.	6.5%	2	$2.45	$3.00	5.2%	6.1%

Sources and Notes:
[1] - [2]: Updated from ThomsonOne as of Nov 30, 2018.
[3] - [4]: From Valueline Investment Analyzer as of Nov 28, 2018.
[5]: ([4]/[3])^(1/4) - 1, where 4 is the number of years between 2022, the middle year of Value Line's 3-5 year forecast, and Value Line's 2018 EPS estim
[6]: Weighted average growth rate. If information is missing from one source, then the combined growth rate is based solely on the other source.

Table No. BV-6

DCF Cost of Equity of the Electric Proxy Group

Panel A: Simple DCF Method

Company	Stock Price [1]	Most Recent Dividend [2]	Quarterly Dividend Yield (t+1) [3]	Combined Long-Term Growth Rate [4]	Quarterly Growth Rate [5]	DCF Cost of Equity [6]
ALLETE	$79.14	$0.56	0.72%	5.7%	1.4%	8.8%
Alliant Energy	$44.84	$0.34	0.76%	6.2%	1.5%	9.4%
Amer. Elec. Power	$76.50	$0.67	0.89%	5.8%	1.4%	9.6%
Ameren Corp.	$68.47	$0.46	0.68%	6.8%	1.7%	9.7%
CMS Energy Corp.	$51.03	$0.36	0.71%	6.9%	1.7%	9.9%
DTE Energy	$118.33	$0.88	0.76%	5.6%	1.4%	8.8%
Entergy Corp.	$86.01	$0.91	1.06%	1.7%	0.4%	6.1%
MGE Energy	$63.98	$0.34	0.54%	8.3%	2.0%	10.6%
OGE Energy	$39.05	$0.37	0.94%	1.1%	0.3%	5.0%
Otter Tail Corp.	$47.91	$0.34	0.71%	6.1%	1.5%	9.1%
AVANGRID Inc.	$49.66	$0.44	0.91%	9.7%	2.3%	13.6%
Consol. Edison	$78.41	$0.72	0.92%	3.2%	0.8%	7.0%
Duke Energy	$87.00	$0.93	1.08%	4.9%	1.2%	9.4%
Eversource Energy	$66.69	$0.51	0.77%	5.7%	1.4%	8.9%
NextEra Energy	$178.42	$1.11	0.63%	8.3%	2.0%	11.0%
PPL Corp.	$31.13	$0.41	1.33%	3.4%	0.8%	8.9%
Public Serv. Enterprise	$54.10	$0.45	0.85%	6.7%	1.6%	10.3%
Southern Co.	$46.61	$0.60	1.29%	2.2%	0.6%	7.6%
Unitil Corp.	$49.97	$0.37	0.74%	4.0%	1.0%	7.1%
Edison Int'l	$54.22	$0.61	1.13%	4.2%	1.0%	8.9%
El Paso Electric	$56.46	$0.36	0.64%	4.4%	1.1%	7.1%
IDACORP Inc.	$98.76	$0.63	0.64%	2.4%	0.6%	5.0%
Pinnacle West Capital	$88.70	$0.74	0.84%	4.5%	1.1%	8.0%
PNM Resources	$42.09	$0.27	0.64%	5.7%	1.4%	8.4%
Portland General	$47.73	$0.36	0.77%	4.9%	1.2%	8.1%
Xcel Energy Inc.	$51.32	$0.38	0.75%	6.1%	1.5%	9.2%

Sources and Notes:
[1]: Supporting Schedule #1 to Table No. BV-6.
[2]: Supporting Schedule #2 to Table No. BV-6.
[3]: ([2] / [1]) x (1 + [5]).
[4]: Table No. BV-5, [6].
[5]: {(1 + [4]) ^ (1/4)} - 1.
[6]: {([3] + [5] + 1) ^ 4} - 1.

Table No. BV-6

DCF Cost of Equity of the Electric Proxy Group

Panel B: Multi-Stage DCF (Using Blue Chip Economic Indicators, October 2018 GDP Growth Forecast as the Perpetual Rate)

Company	Stock Price	Most Recent Dividend	Combined Long-Term Growth Rate	Growth Rate: Year 6	Growth Rate: Year 7	Growth Rate: Year 8	Growth Rate: Year 9	Growth Rate: Year 10	GDP Long-Term Growth Rate	DCF Cost of Equity
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
ALLETE	$79.14	$0.56	5.74%	5.46%	5.19%	4.92%	4.65%	4.37%	4.10%	7.4%
Alliant Energy	$44.84	$0.34	6.19%	5.84%	5.49%	5.15%	4.80%	4.45%	4.10%	7.7%
Amer. Elec. Power	$76.50	$0.67	5.82%	5.54%	5.25%	4.96%	4.67%	4.39%	4.10%	8.2%
Ameren Corp.	$68.47	$0.46	6.81%	6.36%	5.91%	5.45%	5.00%	4.55%	4.10%	7.4%
CMS Energy Corp.	$51.03	$0.36	6.92%	6.45%	5.98%	5.51%	5.04%	4.57%	4.10%	7.6%
DTE Energy	$118.33	$0.88	5.59%	5.34%	5.09%	4.84%	4.60%	4.35%	4.10%	7.6%
Entergy Corp.	$86.01	$0.91	1.70%	2.10%	2.50%	2.90%	3.30%	3.70%	4.10%	7.9%
MGE Energy	$63.98	$0.34	8.29%	7.59%	6.89%	6.19%	5.50%	4.80%	4.10%	7.0%
OGE Energy	$39.05	$0.37	1.15%	1.64%	2.13%	2.62%	3.12%	3.61%	4.10%	7.4%
Otter Tail Corp.	$47.91	$0.34	6.12%	5.78%	5.45%	5.11%	4.77%	4.44%	4.10%	7.5%
AVANGRID Inc.	$49.66	$0.44	9.67%	8.74%	7.82%	6.89%	5.96%	5.03%	4.10%	9.3%
Consol. Edison	$78.41	$0.72	3.15%	3.31%	3.47%	3.63%	3.78%	3.94%	4.10%	7.7%
Duke Energy	$87.00	$0.93	4.85%	4.73%	4.60%	4.48%	4.35%	4.23%	4.10%	8.8%
Eversource Energy	$66.69	$0.51	5.68%	5.42%	5.15%	4.89%	4.63%	4.36%	4.10%	7.6%
NextEra Energy	$178.42	$1.11	8.31%	7.61%	6.90%	6.20%	5.50%	4.80%	4.10%	7.5%
PPL Corp.	$31.13	$0.41	3.36%	3.48%	3.61%	3.73%	3.85%	3.98%	4.10%	9.4%
Public Serv. Enterprise	$54.10	$0.45	6.75%	6.31%	5.87%	5.42%	4.98%	4.54%	4.10%	8.2%
Southern Co.	$46.61	$0.60	2.22%	2.54%	2.85%	3.16%	3.47%	3.79%	4.10%	9.0%
Unitil Corp.	$49.97	$0.37	4.00%	4.02%	4.03%	4.05%	4.07%	4.08%	4.10%	7.2%
Edison Int'l	$54.22	$0.61	4.21%	4.19%	4.17%	4.15%	4.14%	4.12%	4.10%	8.9%
El Paso Electric	$56.46	$0.36	4.42%	4.37%	4.32%	4.26%	4.21%	4.15%	4.10%	6.8%
IDACORP Inc.	$98.76	$0.63	2.37%	2.66%	2.95%	3.24%	3.52%	3.81%	4.10%	6.5%
Pinnacle West Capital	$88.70	$0.74	4.52%	4.45%	4.38%	4.31%	4.24%	4.17%	4.10%	7.7%
PNM Resources	$42.09	$0.27	5.73%	5.46%	5.19%	4.92%	4.64%	4.37%	4.10%	7.0%
Portland General	$47.73	$0.36	4.92%	4.79%	4.65%	4.51%	4.37%	4.24%	4.10%	7.5%
Xcel Energy Inc.	$51.32	$0.38	6.06%	5.73%	5.41%	5.08%	4.75%	4.43%	4.10%	7.6%

Sources and Notes:
[1]: Supporting Schedule #1 to Table No. BV-6.
[2]: Supporting Schedule #2 to Table No. BV-6.
[3]: Table No. BV-5, [6].
[4]: [3] - {([3] - [9])/ 6}.
[5]: [4] - {([3] - [9])/ 6}.
[6]: [5] - {([3] - [9])/ 6}.
[7]: [6] - {([3] - [9])/ 6}.
[8]: [7] - {([3] - [9])/ 6}.
[9]: Blue Chip Economic Indicators, October 2018. This number is assumed to be the perpetual growth rate.
[10]: Supporting Schedule #3 to Table No. BV-6.

Supporting Schedule #1 to Table No. BV-6

Common Stock Prices from November 9, 2018 to November 30, 2018

Company	11/30/2018	11/29/2018	11/28/2018	11/27/2018	11/26/2018	11/23/2018	11/21/2018	11/20/2018	11/19/2018	11/16/2018	11/15/2018	11/14/2018	11/13/2018	11/12/2018	11/9/2018	Average
ALLETE	$81.38	$80.11	$80.20	$79.21	$78.84	$79.02	$79.00	$80.29	$80.11	$79.98	$78.51	$77.78	$78.19	$77.65	$76.85	$79.14
Alliant Energy	$45.39	$44.67	$44.77	$44.79	$44.29	$43.98	$44.07	$45.26	$45.38	$45.25	$45.12	$44.66	$45.12	$45.19	$44.61	$44.84
Amer. Elec. Power	$77.74	$76.35	$76.22	$76.58	$75.96	$75.86	$75.65	$77.82	$77.43	$77.02	$76.79	$76.13	$76.43	$76.20	$75.32	$76.50
Ameren Corp.	$68.62	$67.82	$68.11	$68.68	$67.82	$67.75	$67.52	$69.00	$69.74	$69.30	$69.39	$68.74	$68.83	$68.39	$67.32	$68.47
CMS Energy Corp.	$52.09	$51.31	$51.23	$51.19	$50.96	$50.68	$50.79	$51.74	$51.66	$51.02	$50.65	$50.53	$50.70	$50.70	$50.14	$51.03
DTE Energy	$119.74	$117.67	$117.40	$117.50	$116.70	$116.67	$116.75	$118.50	$119.21	$119.03	$119.31	$119.29	$119.95	$119.05	$118.14	$118.33
Entergy Corp.	$87.06	$85.87	$86.08	$86.29	$85.86	$85.37	$85.35	$86.33	$86.76	$86.32	$85.97	$85.49	$85.90	$85.91	$85.56	$86.01
MGE Energy	$66.09	$64.53	$65.51	$64.19	$64.13	$63.73	$63.26	$63.89	$64.18	$64.75	$63.87	$62.93	$62.97	$62.80	$62.87	$63.98
OGE Energy	$39.62	$38.89	$39.11	$39.26	$39.02	$38.97	$38.82	$39.21	$39.51	$39.16	$39.34	$38.89	$39.16	$38.56	$38.23	$39.05
Otter Tail Corp.	$48.92	$48.35	$48.85	$47.55	$47.66	$47.60	$47.25	$47.37	$47.73	$48.37	$47.75	$47.35	$47.78	$47.72	$48.41	$47.91
AVANGRID Inc.	$50.38	$49.55	$49.30	$49.43	$49.10	$49.20	$49.18	$50.51	$50.61	$50.01	$49.50	$49.94	$50.13	$49.15	$48.91	$49.66
Consol. Edison	$80.35	$79.24	$78.84	$79.05	$78.16	$77.34	$77.11	$78.11	$77.50	$77.00	$76.54	$79.42	$79.11	$79.37	$79.00	$78.41
Duke Energy	$88.57	$87.60	$87.60	$87.83	$86.98	$86.75	$86.45	$88.52	$87.64	$86.68	$86.14	$86.42	$86.35	$85.92	$85.58	$87.00
Eversource Energy	$68.34	$67.07	$67.43	$67.45	$66.80	$66.82	$66.42	$67.64	$67.38	$67.04	$66.20	$65.43	$65.77	$65.48	$65.14	$66.69
NextEra Energy	$181.71	$177.12	$178.05	$178.00	$177.03	$177.33	$176.18	$178.77	$182.01	$180.39	$179.18	$176.82	$178.66	$178.49	$176.56	$178.42
PPL Corp.	$30.59	$30.67	$30.86	$31.12	$30.69	$30.84	$30.64	$31.44	$31.44	$30.83	$30.50	$32.18	$31.89	$31.54	$31.69	$31.13
Public Serv. Enterprise	$55.90	$54.52	$54.71	$54.29	$53.49	$53.23	$53.50	$53.58	$54.56	$54.30	$54.42	$53.91	$53.50	$53.78	$53.79	$54.10
Southern Co.	$47.33	$46.54	$46.12	$46.09	$45.65	$45.72	$45.63	$46.66	$47.04	$46.89	$47.18	$47.40	$47.27	$46.89	$46.81	$46.61
Unitil Corp.	$50.70	$50.58	$51.45	$51.01	$50.91	$50.61	$50.19	$50.59	$49.61	$48.98	$48.37	$48.36	$49.49	$49.27	$49.40	$49.97
Edison Int'l	$55.32	$54.72	$54.76	$55.31	$53.99	$53.25	$53.59	$52.78	$53.91	$54.45	$47.19	$53.87	$55.54	$53.56	$61.00	$54.22
El Paso Electric	$55.35	$54.80	$56.19	$55.56	$55.38	$55.27	$54.98	$56.07	$57.06	$57.00	$56.24	$57.53	$58.57	$58.47	$58.37	$56.46
IDACORP Inc.	$98.24	$97.12	$97.81	$99.09	$98.93	$98.66	$98.38	$99.89	$100.13	$99.77	$98.69	$98.87	$99.33	$98.55	$98.00	$98.76
Pinnacle West Capital	$89.36	$88.84	$89.11	$89.77	$88.64	$88.27	$87.54	$88.30	$88.87	$88.32	$88.70	$88.24	$89.25	$88.86	$88.47	$88.70
PNM Resources	$43.22	$42.22	$42.76	$42.60	$42.34	$42.14	$41.95	$42.54	$42.64	$42.38	$42.01	$41.66	$41.41	$40.83	$40.61	$42.09
Portland General	$48.15	$47.71	$47.96	$47.99	$47.73	$47.37	$47.31	$48.71	$48.53	$48.25	$47.77	$47.40	$47.50	$46.85	$46.68	$47.73
Xcel Energy Inc.	$52.45	$51.53	$51.56	$51.74	$51.10	$50.86	$50.75	$51.81	$51.62	$51.06	$51.37	$51.16	$51.38	$51.11	$50.34	$51.32

Sources and Notes:
Bloomberg as of November 30, 2018.
Daily prices for the 15-trading day period ending November 30, 2018.

Supporting Schedule #2 to Table No. BV-6

Most Recent Dividends

Company	Ex Dividend Date	Most Recent Dividend
ALLETE	11/14/2018	$0.56
Alliant Energy	10/30/2018	$0.34
Amer. Elec. Power	11/8/2018	$0.67
Ameren Corp.	9/11/2018	$0.46
CMS Energy Corp.	11/1/2018	$0.36
DTE Energy	9/14/2018	$0.88
Entergy Corp.	11/7/2018	$0.91
MGE Energy	11/29/2018	$0.34
OGE Energy	10/9/2018	$0.37
Otter Tail Corp.	11/14/2018	$0.34
AVANGRID Inc.	9/6/2018	$0.44
Consol. Edison	11/13/2018	$0.72
Duke Energy	11/15/2018	$0.93
Eversource Energy	9/20/2018	$0.51
NextEra Energy	11/29/2018	$1.11
PPL Corp.	9/7/2018	$0.41
Public Serv. Enterprise	9/6/2018	$0.45
Southern Co.	11/16/2018	$0.60
Unitil Corp.	11/14/2018	$0.37
Edison Int'l	9/27/2018	$0.61
El Paso Electric	9/13/2018	$0.36
IDACORP Inc.	11/2/2018	$0.63
Pinnacle West Capital	10/31/2018	$0.74
PNM Resources	11/1/2018	$0.27
Portland General	9/24/2018	$0.36
Xcel Energy Inc.	9/13/2018	$0.38

Sources and Notes:
Bloomberg as of November 30, 2018.

Supporting Schedule #3 to Table No. BV-6

DCF Cost of Equity of the Electric Proxy Group

Multi-Stage DCF (using Blue Chip Economic Indicators, October 2018 GDP Growth Forecast as the Perpetual Growth Rate)

Year	Company	ALLETE	Alliant Energy	Amer. Elec. Power	Ameren Corp.	CMS Energy Corp.	DTE Energy	Entergy Corp.	MGE Energy	OGE Energy	Otter Tail Corp.	AVANGRID Inc.	Consol. Edison
	Current Dividend	$0.56	$0.34	$0.67	$0.46	$0.36	$0.88	$0.91	$0.34	$0.37	$0.34	$0.44	$0.72
	Current Stock Price	($79.14)	($44.84)	($76.50)	($68.47)	($51.03)	($118.33)	($86.01)	($63.98)	($39.05)	($47.91)	($49.66)	($78.41)
YEAR 2019	Dividend Q1 Estimate	$0.57	$0.34	$0.68	$0.47	$0.36	$0.89	$0.91	$0.34	$0.37	$0.34	$0.45	$0.72
YEAR 2019	Dividend Q2 Estimate	$0.58	$0.35	$0.69	$0.47	$0.37	$0.91	$0.92	$0.35	$0.37	$0.35	$0.46	$0.73
YEAR 2019	Dividend Q3 Estimate	$0.58	$0.35	$0.70	$0.48	$0.38	$0.92	$0.92	$0.36	$0.37	$0.35	$0.47	$0.73
YEAR 2019	Dividend Q4 Estimate	$0.59	$0.36	$0.71	$0.49	$0.38	$0.93	$0.93	$0.37	$0.37	$0.36	$0.48	$0.74
YEAR 2020	Dividend Q1 Estimate	$0.60	$0.36	$0.72	$0.50	$0.39	$0.94	$0.93	$0.37	$0.37	$0.36	$0.49	$0.74
YEAR 2020	Dividend Q2 Estimate	$0.61	$0.37	$0.73	$0.51	$0.40	$0.96	$0.93	$0.38	$0.37	$0.37	$0.51	$0.75
YEAR 2020	Dividend Q3 Estimate	$0.62	$0.37	$0.74	$0.51	$0.40	$0.97	$0.94	$0.39	$0.37	$0.37	$0.52	$0.75
YEAR 2020	Dividend Q4 Estimate	$0.63	$0.38	$0.75	$0.52	$0.41	$0.98	$0.94	$0.40	$0.37	$0.38	$0.53	$0.76
YEAR 2021	Dividend Q1 Estimate	$0.63	$0.38	$0.76	$0.53	$0.42	$1.00	$0.95	$0.40	$0.37	$0.38	$0.54	$0.77
YEAR 2021	Dividend Q2 Estimate	$0.64	$0.39	$0.77	$0.54	$0.42	$1.01	$0.95	$0.41	$0.38	$0.39	$0.55	$0.77
YEAR 2021	Dividend Q3 Estimate	$0.65	$0.40	$0.78	$0.55	$0.43	$1.02	$0.95	$0.42	$0.38	$0.39	$0.57	$0.78
YEAR 2021	Dividend Q4 Estimate	$0.66	$0.40	$0.79	$0.56	$0.44	$1.04	$0.96	$0.43	$0.38	$0.40	$0.58	$0.78
YEAR 2022	Dividend Q1 Estimate	$0.67	$0.41	$0.81	$0.57	$0.44	$1.05	$0.96	$0.44	$0.38	$0.41	$0.59	$0.79
YEAR 2022	Dividend Q2 Estimate	$0.68	$0.41	$0.82	$0.58	$0.45	$1.07	$0.97	$0.45	$0.38	$0.41	$0.61	$0.80
YEAR 2022	Dividend Q3 Estimate	$0.69	$0.42	$0.83	$0.59	$0.46	$1.08	$0.97	$0.45	$0.38	$0.42	$0.62	$0.80
YEAR 2022	Dividend Q4 Estimate	$0.70	$0.43	$0.84	$0.60	$0.47	$1.10	$0.97	$0.46	$0.38	$0.42	$0.64	$0.81
YEAR 2023	Dividend Q1 Estimate	$0.71	$0.43	$0.85	$0.61	$0.48	$1.11	$0.98	$0.47	$0.38	$0.43	$0.65	$0.82
YEAR 2023	Dividend Q2 Estimate	$0.72	$0.44	$0.86	$0.62	$0.48	$1.13	$0.98	$0.48	$0.38	$0.44	$0.67	$0.82
YEAR 2023	Dividend Q3 Estimate	$0.73	$0.45	$0.88	$0.63	$0.49	$1.14	$0.99	$0.49	$0.39	$0.44	$0.68	$0.83
YEAR 2023	Dividend Q4 Estimate	$0.74	$0.45	$0.89	$0.64	$0.50	$1.16	$0.99	$0.50	$0.39	$0.45	$0.70	$0.84
YEAR 2024	Dividend Q1 Estimate	$0.75	$0.46	$0.90	$0.65	$0.51	$1.17	$1.00	$0.51	$0.39	$0.46	$0.71	$0.84
YEAR 2024	Dividend Q2 Estimate	$0.76	$0.47	$0.91	$0.66	$0.52	$1.19	$1.00	$0.52	$0.39	$0.46	$0.73	$0.85
YEAR 2024	Dividend Q3 Estimate	$0.77	$0.47	$0.93	$0.67	$0.52	$1.20	$1.01	$0.53	$0.39	$0.47	$0.74	$0.86
YEAR 2024	Dividend Q4 Estimate	$0.78	$0.48	$0.94	$0.68	$0.53	$1.22	$1.01	$0.54	$0.39	$0.48	$0.76	$0.86
YEAR 2025	Dividend Q1 Estimate	$0.79	$0.49	$0.95	$0.69	$0.54	$1.24	$1.02	$0.55	$0.39	$0.48	$0.77	$0.87
YEAR 2025	Dividend Q2 Estimate	$0.80	$0.49	$0.96	$0.70	$0.55	$1.25	$1.02	$0.56	$0.40	$0.49	$0.79	$0.88
YEAR 2025	Dividend Q3 Estimate	$0.81	$0.50	$0.98	$0.71	$0.56	$1.27	$1.03	$0.57	$0.40	$0.50	$0.80	$0.89
YEAR 2025	Dividend Q4 Estimate	$0.82	$0.51	$0.99	$0.72	$0.56	$1.28	$1.04	$0.58	$0.40	$0.50	$0.82	$0.89
YEAR 2026	Dividend Q1 Estimate	$0.83	$0.51	$1.00	$0.73	$0.57	$1.30	$1.04	$0.59	$0.40	$0.51	$0.83	$0.90
YEAR 2026	Dividend Q2 Estimate	$0.84	$0.52	$1.01	$0.74	$0.58	$1.31	$1.05	$0.60	$0.41	$0.52	$0.85	$0.91
YEAR 2026	Dividend Q3 Estimate	$0.85	$0.52	$1.02	$0.75	$0.59	$1.33	$1.06	$0.60	$0.41	$0.52	$0.86	$0.92
YEAR 2026	Dividend Q4 Estimate	$0.86	$0.53	$1.04	$0.76	$0.59	$1.34	$1.07	$0.61	$0.41	$0.53	$0.87	$0.92
YEAR 2027	Dividend Q1 Estimate	$0.87	$0.54	$1.05	$0.76	$0.60	$1.36	$1.07	$0.62	$0.41	$0.53	$0.89	$0.93
YEAR 2027	Dividend Q2 Estimate	$0.88	$0.54	$1.06	$0.77	$0.61	$1.37	$1.08	$0.63	$0.42	$0.54	$0.90	$0.94
YEAR 2027	Dividend Q3 Estimate	$0.89	$0.55	$1.07	$0.78	$0.62	$1.39	$1.09	$0.64	$0.42	$0.55	$0.91	$0.95
YEAR 2027	Dividend Q4 Estimate	$0.90	$0.56	$1.09	$0.79	$0.62	$1.41	$1.10	$0.65	$0.42	$0.55	$0.93	$0.96
YEAR 2028	Dividend Q1 Estimate	$0.91	$0.56	$1.10	$0.80	$0.63	$1.42	$1.11	$0.66	$0.43	$0.56	$0.94	$0.97
YEAR 2028	Dividend Q2 Estimate	$0.92	$0.57	$1.11	$0.81	$0.64	$1.44	$1.12	$0.66	$0.43	$0.57	$0.95	$0.98
YEAR 2028	Dividend Q3 Estimate	$0.93	$0.58	$1.12	$0.82	$0.65	$1.45	$1.13	$0.67	$0.44	$0.57	$0.96	$0.99
YEAR 2028	Dividend Q4 Estimate	$0.94	$0.58	$1.13	$0.83	$0.65	$1.47	$1.14	$0.68	$0.44	$0.58	$0.97	$1.00
YEAR 2029 Q1	Year 10 Stock Price	$121.93	$69.44	$118.50	$106.33	$79.43	$182.24	$128.05	$99.90	$57.96	$74.04	$80.52	$118.39
	Trial COE: Quarterly Rate	1.8%	1.9%	2.0%	1.8%	1.9%	1.8%	1.9%	1.7%	1.8%	1.8%	2.3%	1.9%
	Trial COE: Annual Rate	7.4%	7.7%	8.2%	7.4%	7.6%	7.6%	7.9%	7.0%	7.4%	7.5%	9.3%	7.7%
	Cost of Equity	7.4%	7.7%	8.2%	7.4%	7.6%	7.6%	7.9%	7.0%	7.4%	7.5%	9.3%	7.7%
	(Trial COE - COE) x 100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Year	Company	Duke Energy	Eversource Energy	NextEra Energy	PPL Corp.	Public Serv. Enterprise	Southern Co.	Unitil Corp.	Edison Int'l	El Paso Electric	IDACORP Inc.	Pinnacle West Capital	PNM Resources	Portland General	Xcel Energy Inc.
	Current Dividend	$0.93	$0.51	$1.11	$0.41	$0.45	$0.60	$0.37	$0.61	$0.36	$0.63	$0.74	$0.27	$0.36	$0.38
	Current Stock Price	($87.00)	($66.69)	($178.42)	($31.13)	($54.10)	($46.61)	($49.97)	($54.22)	($56.46)	($98.76)	($88.70)	($42.09)	($47.73)	($51.32)
YEAR 2019	Dividend Q1 Estimate	$0.94	$0.51	$1.13	$0.41	$0.46	$0.60	$0.37	$0.61	$0.36	$0.63	$0.75	$0.27	$0.37	$0.39
YEAR 2019	Dividend Q2 Estimate	$0.95	$0.52	$1.16	$0.42	$0.46	$0.61	$0.37	$0.62	$0.37	$0.64	$0.75	$0.27	$0.37	$0.39
YEAR 2019	Dividend Q3 Estimate	$0.96	$0.53	$1.18	$0.42	$0.47	$0.61	$0.38	$0.62	$0.37	$0.64	$0.76	$0.28	$0.38	$0.40
YEAR 2019	Dividend Q4 Estimate	$0.97	$0.53	$1.20	$0.42	$0.48	$0.61	$0.38	$0.63	$0.38	$0.64	$0.77	$0.28	$0.38	$0.40
YEAR 2020	Dividend Q1 Estimate	$0.98	$0.54	$1.23	$0.43	$0.49	$0.62	$0.38	$0.64	$0.38	$0.65	$0.78	$0.28	$0.38	$0.41
YEAR 2020	Dividend Q2 Estimate	$1.00	$0.55	$1.25	$0.43	$0.50	$0.62	$0.39	$0.64	$0.38	$0.65	$0.79	$0.29	$0.39	$0.42
YEAR 2020	Dividend Q3 Estimate	$1.01	$0.56	$1.28	$0.43	$0.50	$0.62	$0.39	$0.65	$0.39	$0.66	$0.80	$0.29	$0.39	$0.42
YEAR 2020	Dividend Q4 Estimate	$1.02	$0.56	$1.30	$0.44	$0.51	$0.63	$0.39	$0.66	$0.39	$0.66	$0.81	$0.30	$0.40	$0.43
YEAR 2021	Dividend Q1 Estimate	$1.03	$0.57	$1.33	$0.44	$0.52	$0.63	$0.40	$0.66	$0.40	$0.66	$0.81	$0.30	$0.40	$0.43
YEAR 2021	Dividend Q2 Estimate	$1.04	$0.58	$1.36	$0.45	$0.53	$0.63	$0.40	$0.67	$0.40	$0.67	$0.82	$0.30	$0.41	$0.44
YEAR 2021	Dividend Q3 Estimate	$1.06	$0.59	$1.38	$0.45	$0.54	$0.64	$0.41	$0.68	$0.41	$0.67	$0.83	$0.31	$0.41	$0.45
YEAR 2021	Dividend Q4 Estimate	$1.07	$0.60	$1.41	$0.45	$0.55	$0.64	$0.41	$0.68	$0.41	$0.68	$0.84	$0.31	$0.42	$0.45
YEAR 2022	Dividend Q1 Estimate	$1.08	$0.60	$1.44	$0.46	$0.56	$0.64	$0.41	$0.69	$0.41	$0.68	$0.85	$0.32	$0.42	$0.46
YEAR 2022	Dividend Q2 Estimate	$1.09	$0.61	$1.47	$0.46	$0.57	$0.65	$0.42	$0.70	$0.42	$0.68	$0.86	$0.32	$0.43	$0.47
YEAR 2022	Dividend Q3 Estimate	$1.11	$0.62	$1.50	$0.46	$0.57	$0.65	$0.42	$0.71	$0.42	$0.69	$0.87	$0.33	$0.43	$0.47
YEAR 2022	Dividend Q4 Estimate	$1.12	$0.63	$1.53	$0.47	$0.58	$0.66	$0.43	$0.71	$0.43	$0.69	$0.88	$0.33	$0.44	$0.48
YEAR 2023	Dividend Q1 Estimate	$1.13	$0.64	$1.56	$0.47	$0.59	$0.66	$0.43	$0.72	$0.43	$0.70	$0.89	$0.34	$0.44	$0.49
YEAR 2023	Dividend Q2 Estimate	$1.15	$0.65	$1.59	$0.48	$0.60	$0.66	$0.44	$0.73	$0.44	$0.70	$0.90	$0.34	$0.45	$0.50
YEAR 2023	Dividend Q3 Estimate	$1.16	$0.66	$1.62	$0.48	$0.61	$0.67	$0.44	$0.74	$0.44	$0.70	$0.91	$0.35	$0.46	$0.50
YEAR 2023	Dividend Q4 Estimate	$1.18	$0.67	$1.65	$0.48	$0.62	$0.67	$0.44	$0.74	$0.45	$0.71	$0.92	$0.35	$0.46	$0.51
YEAR 2024	Dividend Q1 Estimate	$1.19	$0.67	$1.68	$0.49	$0.63	$0.67	$0.45	$0.75	$0.45	$0.71	$0.93	$0.35	$0.47	$0.52
YEAR 2024	Dividend Q2 Estimate	$1.20	$0.68	$1.72	$0.49	$0.64	$0.68	$0.45	$0.76	$0.46	$0.72	$0.94	$0.36	$0.47	$0.52
YEAR 2024	Dividend Q3 Estimate	$1.22	$0.69	$1.75	$0.50	$0.65	$0.68	$0.46	$0.77	$0.46	$0.72	$0.95	$0.36	$0.48	$0.53
YEAR 2024	Dividend Q4 Estimate	$1.23	$0.70	$1.78	$0.50	$0.66	$0.69	$0.46	$0.77	$0.47	$0.73	$0.96	$0.37	$0.48	$0.54
YEAR 2025	Dividend Q1 Estimate	$1.24	$0.71	$1.81	$0.50	$0.67	$0.69	$0.47	$0.78	$0.47	$0.73	$0.97	$0.37	$0.49	$0.55
YEAR 2025	Dividend Q2 Estimate	$1.26	$0.72	$1.84	$0.51	$0.68	$0.70	$0.47	$0.79	$0.48	$0.74	$0.98	$0.38	$0.49	$0.55
YEAR 2025	Dividend Q3 Estimate	$1.27	$0.73	$1.87	$0.51	$0.69	$0.70	$0.48	$0.80	$0.48	$0.74	$0.99	$0.38	$0.50	$0.56
YEAR 2025	Dividend Q4 Estimate	$1.29	$0.74	$1.90	$0.52	$0.70	$0.71	$0.48	$0.81	$0.49	$0.75	$1.00	$0.39	$0.51	$0.57
YEAR 2026	Dividend Q1 Estimate	$1.30	$0.75	$1.93	$0.52	$0.71	$0.71	$0.49	$0.82	$0.49	$0.75	$1.01	$0.39	$0.51	$0.58
YEAR 2026	Dividend Q2 Estimate	$1.32	$0.76	$1.96	$0.53	$0.72	$0.72	$0.49	$0.82	$0.50	$0.76	$1.02	$0.40	$0.52	$0.58
YEAR 2026	Dividend Q3 Estimate	$1.33	$0.76	$1.99	$0.53	$0.73	$0.72	$0.50	$0.83	$0.50	$0.77	$1.04	$0.40	$0.52	$0.59
YEAR 2026	Dividend Q4 Estimate	$1.35	$0.77	$2.02	$0.54	$0.74	$0.73	$0.50	$0.84	$0.51	$0.77	$1.05	$0.41	$0.53	$0.60
YEAR 2027	Dividend Q1 Estimate	$1.36	$0.78	$2.05	$0.54	$0.75	$0.73	$0.51	$0.85	$0.51	$0.78	$1.06	$0.41	$0.53	$0.60
YEAR 2027	Dividend Q2 Estimate	$1.37	$0.79	$2.08	$0.55	$0.76	$0.74	$0.51	$0.86	$0.52	$0.79	$1.07	$0.42	$0.54	$0.61
YEAR 2027	Dividend Q3 Estimate	$1.39	$0.80	$2.10	$0.55	$0.77	$0.75	$0.52	$0.87	$0.52	$0.79	$1.08	$0.42	$0.55	$0.62
YEAR 2027	Dividend Q4 Estimate	$1.40	$0.81	$2.13	$0.56	$0.78	$0.75	$0.52	$0.88	$0.53	$0.80	$1.09	$0.43	$0.55	$0.63
YEAR 2028	Dividend Q1 Estimate	$1.42	$0.82	$2.16	$0.56	$0.79	$0.76	$0.53	$0.88	$0.53	$0.81	$1.10	$0.43	$0.56	$0.63
YEAR 2028	Dividend Q2 Estimate	$1.43	$0.83	$2.18	$0.57	$0.79	$0.77	$0.53	$0.89	$0.54	$0.82	$1.11	$0.44	$0.56	$0.64
YEAR 2028	Dividend Q3 Estimate	$1.45	$0.84	$2.21	$0.58	$0.80	$0.78	$0.54	$0.90	$0.55	$0.82	$1.12	$0.44	$0.57	$0.65
YEAR 2028	Dividend Q4 Estimate	$1.46	$0.85	$2.23	$0.58	$0.81	$0.78	$0.54	$0.91	$0.55	$0.83	$1.14	$0.45	$0.57	$0.65
YEAR 2029 Q1	Year 10 Stock Price	$133.88	$102.84	$280.17	$47.15	$84.49	$69.64	$75.92	$82.86	$85.97	$148.37	$135.53	$64.70	$73.10	$79.37
	Trial COE: Quarterly Rate	2.1%	1.9%	1.8%	2.3%	2.0%	2.2%	1.7%	2.1%	1.7%	1.6%	1.9%	1.7%	1.8%	1.9%
	Trial COE: Annual Rate	8.8%	7.6%	7.5%	9.4%	8.2%	9.0%	7.2%	8.9%	6.8%	6.5%	7.7%	7.0%	7.5%	7.6%
	Cost of Equity	8.8%	7.6%	7.5%	9.4%	8.2%	9.0%	7.2%	8.9%	6.8%	6.5%	7.7%	7.0%	7.5%	7.6%
	(Trial COE - COE) x 100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Sources and Notes:
All Growth Rate Estimates: Table No. BV-6; Panel B.
Stock Prices and Dividends are from Bloomberg as of November 30, 2018.
1. See Supporting Schedule #1 to Table No. BV-6 for the average closing stock price obtained from Bloomberg.
2. See Supporting Schedule #2 to Table No. BV-6 for the for the quarterly dividend obtained from Bloomberg.
3. See Supporting Schedule #4 to Table No. BV-6 for the Growth Rate used to calculate the Year 10 Stock Price.
Year 10 Stock Price = {(the Dividend Year 2028 Q4 Estimate) x ((1 + the Perpetual Growth Rate) ^ (1/4) x (1 + Quarterly Rate))} /
{(Quarterly Rate) - ((1 + the Perpetual Growth Rate) ^ (1/4) -1)}.

Table No. BV-7

Overall After-Tax DCF Cost of Capital of the Electric Proxy Group

Panel A: Simple DCF Method

Company	3rd Quarter, 2018 Bond Rating [1]	3rd Quarter, 2018 Preferred Equity Rating [2]	DCF Cost of Equity [3]	DCF Common Equity to Market Value Ratio [4]	Cost of Preferred Equity [5]	DCF Preferred Equity to Market Value Ratio [6]	DCF Cost of Debt [7]	DCF Debt to Market Value Ratio [8]	Con Edison Income Tax Rate [9]	Overall After-Tax Cost of Capital [10]
ALLETE	BBB	-	8.8%	71.4%	-	0.0%	5.0%	28.6%	26.1%	7.3%
Alliant Energy	A	A	9.4%	61.1%	4.5%	2.3%	4.5%	36.6%	26.1%	7.1%
Amer. Elec. Power	A	-	9.6%	58.2%	-	0.0%	4.5%	41.8%	26.1%	7.0%
Ameren Corp.	BBB	-	9.7%	64.6%	-	0.0%	5.0%	35.4%	26.1%	7.6%
CMS Energy Corp.	BBB	-	9.9%	55.9%	-	0.0%	5.0%	44.1%	26.1%	7.2%
DTE Energy	BBB	-	8.8%	59.6%	-	0.0%	5.0%	40.4%	26.1%	6.7%
Entergy Corp.	BBB	BBB	6.1%	45.9%	5.0%	0.6%	5.0%	53.5%	26.1%	4.8%
MGE Energy	AA	-	10.6%	80.2%	-	0.0%	4.3%	19.8%	26.1%	9.1%
OGE Energy	BBB	-	~~5.0%~~	68.8%	-	0.0%	5.0%	31.2%	26.1%	~~4.6%~~
Otter Tail Corp.	BBB	-	9.1%	74.7%	-	0.0%	5.0%	25.3%	26.1%	7.7%
AVANGRID Inc.	BBB	-	13.6%	69.8%	-	0.0%	5.0%	30.2%	26.1%	10.6%
Consol. Edison	A	-	7.0%	55.4%	-	0.0%	4.5%	44.6%	26.1%	5.4%
Duke Energy	A	-	9.4%	51.7%	-	0.0%	4.5%	48.3%	26.1%	6.5%
Eversource Energy	A	A	8.9%	59.6%	4.5%	0.4%	4.5%	39.9%	26.1%	6.7%
NextEra Energy	A	-	11.0%	71.6%	-	0.0%	4.5%	28.4%	26.1%	8.8%
PPL Corp.	A	-	8.9%	46.9%	-	0.0%	4.5%	53.1%	26.1%	6.0%
Public Serv. Enterprise	BBB	-	10.3%	64.0%	-	0.0%	5.0%	36.0%	26.1%	7.9%
Southern Co.	A	A	7.6%	49.0%	4.5%	0.3%	4.5%	50.7%	26.1%	5.4%
Unitil Corp.	BBB	BBB	7.1%	59.5%	5.0%	0.0%	5.0%	40.5%	26.1%	5.7%
Edison Int'l	BBB	BBB	8.9%	48.7%	5.0%	6.0%	5.0%	45.3%	26.1%	6.3%
El Paso Electric	BBB	-	7.1%	58.5%	-	0.0%	5.0%	41.5%	26.1%	5.7%
IDACORP Inc.	BBB	-	~~5.0%~~	71.3%	-	0.0%	5.0%	28.7%	26.1%	~~4.6%~~
Pinnacle West Capital	A	-	8.0%	64.3%	-	0.0%	4.5%	35.7%	26.1%	6.4%
PNM Resources	BBB	BBB	8.4%	54.1%	5.0%	0.2%	5.0%	45.7%	26.1%	6.2%
Portland General	BBB	-	8.1%	60.1%	-	0.0%	5.0%	39.9%	26.1%	6.4%
Xcel Energy Inc.	A	-	9.2%	59.5%	-	0.0%	4.5%	40.5%	26.1%	6.9%
Simple Proxy Group Average			9.0%	60.2%	4.8%	0.4%	4.8%	39.4%	26.1%	6.9%

Sources and Notes:
[1]: S&P Credit Ratings from Research Insight.
[2]: Preferred ratings were assumed equal to debt ratings.
[3]: Table No. BV-6; Panel A, [6].
[4]: Table No. BV-4, [1].
[5]: Supporting Schedule #2 to Table No. BV-11, Panel C.
[6]: Table No. BV-4, [2].
[7]: Supporting Schedule #2 to Table No. BV-11, Panel B.
[8]: Table No. BV-4, [3].
[9]: Composite Federal and State Corporate Tax Rate.
[10]: ([3] x [4]) + ([5] x [6]) + {[7] x [8] x (1 - [9])}.
*Strikethrough indicates the estimate is excluded because it does not exceed the company's cost of debt estimate by at least 100bps

Table No. BV-7

Overall After-Tax DCF Cost of Capital of the Electric Proxy Group

Panel B: Multi-Stage DCF (Using Blue Chip Economic Indicators, October 2018 GDP Growth Forecast as the Perpetual Rate)

Company	3rd Quarter, 2018 Bond Rating [1]	3rd Quarter, 2018 Preferred Equity Rating [2]	DCF Cost of Equity [3]	DCF Common Equity to Market Value Ratio [4]	Cost of Preferred Equity [5]	DCF Preferred Equity to Market Value Ratio [6]	DCF Cost of Debt [7]	DCF Debt to Market Value Ratio [8]	Con Edison Income Tax Rate [9]	Overall After-Tax Cost of Capital [10]
ALLETE	BBB	-	7.4%	71.4%	-	0.0%	5.0%	28.6%	26.1%	6.3%
Alliant Energy	A	A	7.7%	61.1%	4.5%	2.3%	4.5%	36.6%	26.1%	6.0%
Amer. Elec. Power	A	-	8.2%	58.2%	-	0.0%	4.5%	41.8%	26.1%	6.2%
Ameren Corp.	BBB	-	7.4%	64.6%	-	0.0%	5.0%	35.4%	26.1%	6.1%
CMS Energy Corp.	BBB	-	7.6%	55.9%	-	0.0%	5.0%	44.1%	26.1%	5.9%
DTE Energy	BBB	-	7.6%	59.6%	-	0.0%	5.0%	40.4%	26.1%	6.0%
Entergy Corp.	BBB	BBB	7.9%	45.9%	5.0%	0.6%	5.0%	53.5%	26.1%	5.6%
MGE Energy	AA	-	7.0%	80.2%	-	0.0%	4.3%	19.8%	26.1%	6.3%
OGE Energy	BBB	-	7.4%	68.8%	-	0.0%	5.0%	31.2%	26.1%	6.2%
Otter Tail Corp.	BBB	-	7.5%	74.7%	-	0.0%	5.0%	25.3%	26.1%	6.5%
AVANGRID Inc.	BBB	-	9.3%	69.8%	-	0.0%	5.0%	30.2%	26.1%	7.6%
Consol. Edison	A	-	7.7%	55.4%	-	0.0%	4.5%	44.6%	26.1%	5.8%
Duke Energy	A	-	8.8%	51.7%	-	0.0%	4.5%	48.3%	26.1%	6.2%
Eversource Energy	A	A	7.6%	59.6%	4.5%	0.4%	4.5%	39.9%	26.1%	5.9%
NextEra Energy	A	-	7.5%	71.6%	-	0.0%	4.5%	28.4%	26.1%	6.3%
PPL Corp.	A	-	9.4%	46.9%	-	0.0%	4.5%	53.1%	26.1%	6.2%
Public Serv. Enterprise	BBB	-	8.2%	64.0%	-	0.0%	5.0%	36.0%	26.1%	6.6%
Southern Co.	A	A	9.0%	49.0%	4.5%	0.3%	4.5%	50.7%	26.1%	6.1%
Unitil Corp.	BBB	BBB	7.2%	59.5%	5.0%	0.0%	5.0%	40.5%	26.1%	5.7%
Edison Int'l	BBB	BBB	8.9%	48.7%	5.0%	6.0%	5.0%	45.3%	26.1%	6.3%
El Paso Electric	BBB	-	6.8%	58.5%	-	0.0%	5.0%	41.5%	26.1%	5.5%
IDACORP Inc.	BBB	-	6.5%	71.3%	-	0.0%	5.0%	28.7%	26.1%	5.7%
Pinnacle West Capital	A	-	7.7%	64.3%	-	0.0%	4.5%	35.7%	26.1%	6.1%
PNM Resources	BBB	BBB	7.0%	54.1%	5.0%	0.2%	5.0%	45.7%	26.1%	5.5%
Portland General	BBB	-	7.5%	60.1%	-	0.0%	5.0%	39.9%	26.1%	6.0%
Xcel Energy Inc.	A	-	7.6%	59.5%	-	0.0%	4.5%	40.5%	26.1%	5.9%
Multi Proxy Group Average			7.8%	60.9%	4.8%	0.4%	4.8%	38.7%	26.1%	6.1%

Sources and Notes:
[1]: S&P Credit Ratings from Research Insight.
[2]: Preferred ratings were assumed equal to debt ratings.
[3]: Table No. BV-6; Panel B, [10].
[4]: Table No. BV-4, [1].
[5]: Supporting Schedule #2 to Table No. BV-11, Panel C.
[6]: Table No. BV-4, [2].
[7]: Supporting Schedule #2 to Table No. BV-11, Panel B.
[8]: Table No. BV-4, [3].
[9]: Composite Federal and State Corporate Tax Rate.
[10]: ([3] x [4]) + ([5] x [6]) + {[7] x [8] x (1 - [9])}.
*Strikethrough indicates the estimate is excluded because it does not exceed the company's cost of debt estimate by at least 100bps

Table No. BV-8

DCF Cost of Equity at Con Edison's Regulatory Capital Structure

	Overall After-Tax Cost of Capital [1]	Con Edison Regulatory % Debt [2]	Representative Cost of A Rated Utility Debt [3]	Con Edison Income Tax Rate [4]	Con Edison Regulatory % Equity [5]	Estimated Return on Equity [6]
Simple DCF	6.9%	50.0%	4.5%	26.1%	50.0%	10.4%
Multi-Stage DCF	6.1%	50.0%	4.5%	26.1%	50.0%	8.8%

Sources and Notes:
[1]: Table No. BV-7; Panels A-B, [10].
[2]: Con Edison Regulatory Capital Structure.
[3]: Based on an A rating. Yield from Bloomberg as of November 30, 2018.
[4]: Composite Federal and State Corporate Tax Rate.
[5]: Con Edison Regulatory Capital Structure.
[6]: {[1] - ([2] x [3] x (1 - [4]))} / [5].

Table No. BV-9

Risk Free Rate

[1]	Blue Chip Economic Indicators 10 year Forecast	3.60%
	U.S. Government Bond Yields	
[2]	20-Year	5.08%
[3]	10-Year	4.60%
[4]	Maturity Premium	0.50%
[5]	Blue Chip Economic Indicators 10 year Forecast Adjusted to 20-year Horizon	4.10%

Sources and Notes:

[1]: Blue Chip Economic Indicators, October 2018.

[2]-[3]: Supporting Schedule # 1 to Table No. BV-9. Averages of monthly bond yields from January 1990 through November 2018.

[4]: [2] - [3].

[5]: [1] + [4].

Supporting Schedule # 1 to Table No. BV-9

U.S. Government Bond Yields as reported by Bloomberg (%)

Date	10-Year	20-Year
1/31/1990	8.21	8.24
2/28/1990	8.47	8.49
3/31/1990	8.59	8.58
4/30/1990	8.79	8.77
5/31/1990	8.76	8.74
6/30/1990	8.48	8.47
7/31/1990	8.47	8.48
8/31/1990	8.75	8.81
9/30/1990	8.89	8.96
10/31/1990	8.72	8.79
11/30/1990	8.39	8.47
12/31/1990	8.08	8.16
1/31/1991	8.09	8.19
2/28/1991	7.85	7.95
3/31/1991	8.11	8.20
4/30/1991	8.04	8.13
5/31/1991	8.07	8.17
6/30/1991	8.28	8.38
7/31/1991	8.27	8.37
8/31/1991	7.90	8.03
9/30/1991	7.65	7.80
10/31/1991	7.53	7.73
11/30/1991	7.42	7.67
12/31/1991	7.09	7.39
1/31/1992	7.03	7.30
2/29/1992	7.34	7.59
3/31/1992	7.54	7.76
4/30/1992	7.48	7.72
5/31/1992	7.39	7.65
6/30/1992	7.26	7.56
7/31/1992	6.84	7.24
8/31/1992	6.59	7.00
9/30/1992	6.42	6.88
10/31/1992	6.59	7.07
11/30/1992	6.87	7.24
12/31/1992	6.77	7.10

Supporting Schedule # 1 to Table No. BV-9

U.S. Government Bond Yields as reported by Bloomberg (%)

Date	10-Year	20-Year
1/31/1993	6.60	6.98
2/28/1993	6.26	6.67
3/31/1993	5.98	6.40
4/30/1993	5.97	6.41
5/31/1993	6.04	6.48
6/30/1993	5.96	6.39
7/31/1993	5.81	6.23
8/31/1993	5.68	6.00
9/30/1993	5.36	5.68
10/31/1993	5.33	6.07
11/30/1993	5.72	6.38
12/31/1993	5.77	6.40
1/31/1994	5.75	6.39
2/28/1994	5.97	6.57
3/31/1994	6.48	7.00
4/30/1994	6.97	7.40
5/31/1994	7.18	7.54
6/30/1994	7.10	7.51
7/31/1994	7.30	7.67
8/31/1994	7.24	7.62
9/30/1994	7.46	7.87
10/31/1994	7.74	8.08
11/30/1994	7.96	8.20
12/31/1994	7.81	7.99
1/31/1995	7.78	7.97
2/28/1995	7.47	7.73
3/31/1995	7.20	7.57
4/30/1995	7.06	7.45
5/31/1995	6.63	7.01
6/30/1995	6.17	6.59
7/31/1995	6.28	6.74
8/31/1995	6.49	6.92
9/30/1995	6.20	6.65
10/31/1995	6.04	6.45
11/30/1995	5.93	6.33
12/31/1995	5.71	6.12

Supporting Schedule # 1 to Table No. BV-9

U.S. Government Bond Yields as reported by Bloomberg (%)

Date	10-Year	20-Year
1/31/1996	5.65	6.11
2/29/1996	5.81	6.30
3/31/1996	6.27	6.74
4/30/1996	6.51	6.98
5/31/1996	6.74	7.11
6/30/1996	6.91	7.22
7/31/1996	6.87	7.14
8/31/1996	6.64	6.97
9/30/1996	6.83	7.17
10/31/1996	6.53	6.90
11/30/1996	6.20	6.58
12/31/1996	6.30	6.65
1/31/1997	6.58	6.91
2/28/1997	6.42	6.77
3/31/1997	6.69	7.05
4/30/1997	6.89	7.20
5/31/1997	6.71	7.02
6/30/1997	6.49	6.84
7/31/1997	6.22	6.56
8/31/1997	6.30	6.65
9/30/1997	6.21	6.56
10/31/1997	6.03	6.38
11/30/1997	5.88	6.20
12/31/1997	5.81	6.07
1/31/1998	5.54	5.88
2/28/1998	5.57	5.96
3/31/1998	5.65	6.01
4/30/1998	5.64	6.00
5/31/1998	5.65	6.01
6/30/1998	5.50	5.80
7/31/1998	5.46	5.78
8/31/1998	5.34	5.66
9/30/1998	4.81	5.38
10/31/1998	4.53	5.30
11/30/1998	4.83	5.48
12/31/1998	4.65	5.36

Supporting Schedule # 1 to Table No. BV-9

U.S. Government Bond Yields as reported by Bloomberg (%)

Date	10-Year	20-Year
1/31/1999	4.72	5.45
2/28/1999	5.00	5.66
3/31/1999	5.23	5.87
4/30/1999	5.18	5.82
5/31/1999	5.54	6.08
6/30/1999	5.90	6.36
7/31/1999	5.79	6.28
8/31/1999	5.94	6.43
9/30/1999	5.92	6.50
10/31/1999	6.11	6.66
11/30/1999	6.03	6.48
12/31/1999	6.28	6.69
1/31/2000	6.66	6.86
2/29/2000	6.52	6.54
3/31/2000	6.26	6.38
4/30/2000	5.99	6.18
5/31/2000	6.44	6.55
6/30/2000	6.10	6.28
7/31/2000	6.05	6.20
8/31/2000	5.83	6.02
9/30/2000	5.80	6.09
10/31/2000	5.74	6.04
11/30/2000	5.72	5.98
12/31/2000	5.24	5.64
1/31/2001	5.16	5.65
2/28/2001	5.10	5.62
3/31/2001	4.89	5.49
4/30/2001	5.14	5.78
5/31/2001	5.39	5.92
6/30/2001	5.28	5.82
7/31/2001	5.24	5.75
8/31/2001	4.97	5.58
9/30/2001	4.73	5.53
10/31/2001	4.57	5.34
11/30/2001	4.65	5.33
12/31/2001	5.09	5.76

Supporting Schedule # 1 to Table No. BV-9

U.S. Government Bond Yields as reported by Bloomberg (%)

Date	10-Year	20-Year
1/31/2002	5.04	5.69
2/28/2002	4.91	5.61
3/31/2002	5.28	5.93
4/30/2002	5.21	5.85
5/31/2002	5.16	5.81
6/30/2002	4.93	5.65
7/31/2002	4.65	5.51
8/31/2002	4.26	5.19
9/30/2002	3.87	4.87
10/31/2002	3.94	5.00
11/30/2002	4.05	5.04
12/31/2002	4.03	5.01
1/31/2003	4.05	5.02
2/28/2003	3.90	4.87
3/31/2003	3.81	4.82
4/30/2003	3.96	4.91
5/31/2003	3.57	4.52
6/30/2003	3.33	4.34
7/31/2003	3.98	4.92
8/31/2003	4.45	5.39
9/30/2003	4.27	5.21
10/31/2003	4.29	5.21
11/30/2003	4.30	5.17
12/31/2003	4.27	5.11
1/31/2004	4.15	5.01
2/29/2004	4.08	4.94
3/31/2004	3.83	4.72
4/30/2004	4.35	5.16
5/31/2004	4.72	5.46
6/30/2004	4.73	5.45
7/31/2004	4.50	5.24
8/31/2004	4.28	5.07
9/30/2004	4.13	4.89
10/31/2004	4.10	4.85
11/30/2004	4.19	4.89
12/31/2004	4.23	4.88

Supporting Schedule # 1 to Table No. BV-9

U.S. Government Bond Yields as reported by Bloomberg (%)

Date	10-Year	20-Year
1/31/2005	4.22	4.77
2/28/2005	4.17	4.61
3/31/2005	4.50	4.89
4/30/2005	4.34	4.75
5/31/2005	4.14	4.56
6/30/2005	4.00	4.35
7/31/2005	4.18	4.48
8/31/2005	4.26	4.53
9/30/2005	4.20	4.51
10/31/2005	4.46	4.74
11/30/2005	4.54	4.83
12/31/2005	4.47	4.73
1/31/2006	4.42	4.65
2/28/2006	4.57	4.73
3/31/2006	4.72	4.91
4/30/2006	4.99	5.22
5/31/2006	5.11	5.35
6/30/2006	5.11	5.29
7/31/2006	5.09	5.25
8/31/2006	4.88	5.08
9/30/2006	4.72	4.93
10/31/2006	4.73	4.94
11/30/2006	4.60	4.78
12/31/2006	4.56	4.78
1/31/2007	4.76	4.95
2/28/2007	4.72	4.93
3/31/2007	4.56	4.81
4/30/2007	4.69	4.95
5/31/2007	4.75	4.98
6/30/2007	5.10	5.29
7/31/2007	5.00	5.19
8/31/2007	4.67	5.00
9/30/2007	4.52	4.84
10/31/2007	4.53	4.83
11/30/2007	4.15	4.56
12/31/2007	4.10	4.57

Supporting Schedule # 1 to Table No. BV-9

U.S. Government Bond Yields as reported by Bloomberg (%)

Date	10-Year	20-Year
1/31/2008	3.74	4.35
2/29/2008	3.74	4.49
3/31/2008	3.51	4.36
4/30/2008	3.67	4.44
5/31/2008	3.88	4.60
6/30/2008	4.10	4.74
7/31/2008	4.01	4.62
8/31/2008	3.89	4.53
9/30/2008	3.69	4.32
10/31/2008	3.81	4.45
11/30/2008	3.53	4.27
12/31/2008	2.42	3.18
1/31/2009	2.52	3.46
2/28/2009	2.87	3.83
3/31/2009	2.82	3.78
4/30/2009	2.93	3.84
5/31/2009	3.29	4.22
6/30/2009	3.72	4.51
7/31/2009	3.56	4.38
8/31/2009	3.59	4.33
9/30/2009	3.40	4.14
10/31/2009	3.39	4.16
11/30/2009	3.40	4.24
12/31/2009	3.59	4.40
1/31/2010	3.73	4.50
2/28/2010	3.69	4.48
3/31/2010	3.73	4.49
4/30/2010	3.85	4.53
5/31/2010	3.42	4.11
6/30/2010	3.20	3.95
7/31/2010	3.01	3.80
8/31/2010	2.70	3.52
9/30/2010	2.65	3.47
10/31/2010	2.54	3.52
11/30/2010	2.76	3.82
12/31/2010	3.29	4.17

Supporting Schedule # 1 to Table No. BV-9

U.S. Government Bond Yields as reported by Bloomberg (%)

Date	10-Year	20-Year
1/31/2011	3.39	4.28
2/28/2011	3.58	4.42
3/31/2011	3.41	4.27
4/30/2011	3.45	4.28
5/31/2011	3.17	4.01
6/30/2011	3.00	3.91
7/31/2011	3.00	3.95
8/31/2011	2.30	3.24
9/30/2011	1.98	2.83
10/31/2011	2.15	2.87
11/30/2011	2.01	2.72
12/31/2011	1.98	2.67
1/31/2012	1.97	2.70
2/29/2012	1.97	2.75
3/31/2012	2.17	2.94
4/30/2012	2.05	2.82
5/31/2012	1.80	2.53
6/30/2012	1.62	2.31
7/31/2012	1.53	2.22
8/31/2012	1.68	2.40
9/30/2012	1.72	2.49
10/31/2012	1.75	2.51
11/30/2012	1.65	2.39
12/31/2012	1.72	2.47
1/31/2013	1.91	2.68
2/28/2013	1.98	2.78
3/31/2013	1.96	2.78
4/30/2013	1.76	2.55
5/31/2013	1.93	2.73
6/30/2013	2.30	3.07
7/31/2013	2.58	3.31
8/31/2013	2.74	3.49
9/30/2013	2.81	3.53
10/31/2013	2.62	3.38
11/30/2013	2.72	3.50
12/31/2013	2.90	3.63

Supporting Schedule # 1 to Table No. BV-9

U.S. Government Bond Yields as reported by Bloomberg (%)

Date	10-Year	20-Year
1/31/2014	2.86	3.52
2/28/2014	2.71	3.38
3/31/2014	2.72	3.35
4/30/2014	2.71	3.27
5/31/2014	2.56	3.12
6/30/2014	2.60	3.15
7/31/2014	2.54	3.07
8/31/2014	2.42	2.94
9/30/2014	2.53	3.01
10/31/2014	2.30	2.77
11/30/2014	2.33	2.76
12/31/2014	2.21	2.55
1/31/2015	1.88	2.20
2/28/2015	1.98	2.34
3/31/2015	2.04	2.41
4/30/2015	1.94	2.33
5/31/2015	2.20	2.69
6/30/2015	2.36	2.85
7/31/2015	2.32	2.77
8/31/2015	2.17	2.55
9/30/2015	2.17	2.62
10/31/2015	2.07	2.50
11/30/2015	2.26	2.69
12/31/2015	2.24	2.61
1/31/2016	2.09	2.49
2/29/2016	1.78	2.20
3/31/2016	1.89	2.28
4/30/2016	1.81	2.21
5/31/2016	1.81	2.22
6/30/2016	1.64	2.02
7/31/2016	1.50	1.82
8/31/2016	1.56	1.89
9/30/2016	1.63	2.02
10/31/2016	1.76	2.17
11/30/2016	2.14	2.54
12/31/2016	2.49	2.84

Supporting Schedule # 1 to Table No. BV-9

U.S. Government Bond Yields as reported by Bloomberg (%)

Date	10-Year	20-Year
1/31/2017	2.43	2.75
2/28/2017	2.42	2.76
3/31/2017	2.48	2.83
4/30/2017	2.30	2.67
5/31/2017	2.30	2.70
6/30/2017	2.19	2.54
7/31/2017	2.32	2.65
8/31/2017	2.21	2.55
9/30/2017	2.20	2.53
10/31/2017	2.36	2.65
11/30/2017	2.35	2.60
12/31/2017	2.40	2.60
1/31/2018	2.58	2.73
2/28/2018	2.86	3.02
3/31/2018	2.84	2.97
4/30/2018	2.87	2.96
5/31/2018	2.98	3.05
6/30/2018	2.91	2.98
7/31/2018	2.89	2.94
8/31/2018	2.89	2.97
9/30/2018	3.00	3.08
10/31/2018	3.15	3.27
11/30/2018	3.12	3.27

Table No. BV-10

Risk Positioning Cost of Equity of the Electric Proxy Group

Long-Term Risk Free Rate of 4.10%, Long-Term Market Risk Premium of 7.07%

Company	Long-Term Risk-Free Rate [1]	ValueLine Beta [2]	Long-Term Market Risk Premium [3]	CAPM Cost of Equity [4]	ECAPM (1.5%) Cost of Equity [5]
ALLETE	4.1%	0.65	7.1%	8.7%	9.2%
Alliant Energy	4.1%	0.60	7.1%	8.3%	8.9%
Amer. Elec. Power	4.1%	0.55	7.1%	8.0%	8.7%
Ameren Corp.	4.1%	0.55	7.1%	8.0%	8.7%
CMS Energy Corp.	4.1%	0.55	7.1%	8.0%	8.7%
DTE Energy	4.1%	0.55	7.1%	8.0%	8.7%
Entergy Corp.	4.1%	0.60	7.1%	8.3%	8.9%
MGE Energy	4.1%	0.60	7.1%	8.3%	8.9%
OGE Energy	4.1%	0.85	7.1%	10.1%	10.3%
Otter Tail Corp.	4.1%	0.75	7.1%	9.4%	9.8%
AVANGRID Inc.	4.1%	0.30	7.1%	6.2%	7.3%
Consol. Edison	4.1%	0.40	7.1%	6.9%	7.8%
Duke Energy	4.1%	0.50	7.1%	7.6%	8.4%
Eversource Energy	4.1%	0.60	7.1%	8.3%	8.9%
NextEra Energy	4.1%	0.55	7.1%	8.0%	8.7%
PPL Corp.	4.1%	0.70	7.1%	9.0%	9.5%
Public Serv. Enterprise	4.1%	0.60	7.1%	8.3%	8.9%
Southern Co.	4.1%	0.50	7.1%	7.6%	8.4%
Unitil Corp.	4.1%	0.55	7.1%	8.0%	8.7%
Edison Int'l	4.1%	0.55	7.1%	8.0%	8.7%
El Paso Electric	4.1%	0.65	7.1%	8.7%	9.2%
IDACORP Inc.	4.1%	0.55	7.1%	8.0%	8.7%
Pinnacle West Capital	4.1%	0.55	7.1%	8.0%	8.7%
PNM Resources	4.1%	0.65	7.1%	8.7%	9.2%
Portland General	4.1%	0.60	7.1%	8.3%	8.9%
Xcel Energy Inc.	4.1%	0.50	7.1%	7.6%	8.4%

Sources and Notes:
[1]: Villadsen Direct Evidence.
[2]: From Valueline Investment Analyzer as of Nov 28, 2018.
[3]: Villadsen Direct Evidence.
[4]: [1] + ([2] x [3]).
[5]: ([1] + 1.5%) + [2] x ([3] - 1.5%).

Supporting Schedule # 1 to Table No. BV-10

ValueLine Betas

Company	[1]
ALLETE	0.65
Alliant Energy	0.60
Amer. Elec. Power	0.55
Ameren Corp.	0.55
CMS Energy Corp.	0.55
DTE Energy	0.55
Entergy Corp.	0.60
MGE Energy	0.60
OGE Energy	0.85
Otter Tail Corp.	0.75
AVANGRID Inc.	0.30
Consol. Edison	0.40
Duke Energy	0.50
Eversource Energy	0.60
NextEra Energy	0.55
PPL Corp.	0.70
Public Serv. Enterprise	0.60
Southern Co.	0.50
Unitil Corp.	0.55
Edison Int'l	0.55
El Paso Electric	0.65
IDACORP Inc.	0.55
Pinnacle West Capital	0.55
PNM Resources	0.65
Portland General	0.60
Xcel Energy Inc.	0.50

Sources and Notes:
[1]: From Valueline Investment Analyzer as of Nov 28, 2018.

Table No. BV-11

Overall After-Tax Cost of Capital of the Electric Proxy Group

Long-Term Risk Free Rate of 4.10%, Long-Term Market Risk Premium of 7.07%

Company	CAPM Cost of Equity [1]	ECAPM (1.5%) Cost of Equity [2]	5-Year Average Common Equity to Market Value Ratio [3]	Cost of Preferred Equity [4]	5-Year Average Preferred Equity to Market Value Ratio [5]	Cost of Debt [6]	5-Year Average Debt to Market Value Ratio [7]	Con Edison Income Tax Rate [8]	Overall After-Tax Cost of Capital (CAPM) [9]	Overall After-Tax Cost of Capital (ECAPM 1.5%) [10]
ALLETE	8.7%	9.2%	64.0%	-	0.0%	5.0%	36.0%	26.1%	6.9%	7.2%
Alliant Energy	8.3%	8.9%	60.9%	4.5%	1.7%	4.5%	37.3%	26.1%	6.4%	6.8%
Amer. Elec. Power	8.0%	8.7%	56.8%	-	0.0%	4.8%	43.2%	26.1%	6.1%	6.5%
Ameren Corp.	8.0%	8.7%	59.6%	-	0.0%	5.0%	40.4%	26.1%	6.2%	6.6%
CMS Energy Corp.	8.0%	8.7%	50.9%	-	0.0%	5.0%	49.1%	26.1%	5.9%	6.2%
DTE Energy	8.0%	8.7%	60.0%	-	0.0%	5.0%	40.0%	26.1%	6.3%	6.7%
Entergy Corp.	8.3%	8.9%	47.8%	5.0%	0.9%	5.0%	51.4%	26.1%	5.9%	6.2%
MGE Energy	8.3%	8.9%	78.8%	-	0.0%	4.3%	21.2%	26.1%	7.3%	7.7%
OGE Energy	10.1%	10.3%	69.6%	-	0.0%	4.6%	30.4%	26.1%	8.1%	8.2%
Otter Tail Corp.	9.4%	9.8%	68.5%	-	0.0%	5.0%	31.5%	26.1%	7.6%	7.9%
AVANGRID Inc.	6.2%	7.3%	70.2%	-	0.0%	5.0%	29.8%	26.1%	5.5%	6.2%
Consol. Edison	6.9%	7.8%	58.0%	-	0.0%	4.5%	42.0%	26.1%	5.4%	6.0%
Duke Energy	7.6%	8.4%	52.6%	-	0.0%	4.6%	47.4%	26.1%	5.6%	6.0%
Eversource Energy	8.3%	8.9%	60.6%	4.5%	0.6%	4.5%	38.8%	26.1%	6.4%	6.7%
NextEra Energy	8.0%	8.7%	61.6%	-	0.0%	4.5%	38.4%	26.1%	6.2%	6.6%
PPL Corp.	9.0%	9.5%	48.9%	-	0.0%	4.6%	51.1%	26.1%	6.2%	6.4%
Public Serv. Enterprise	8.3%	8.9%	64.9%	-	0.0%	5.0%	35.1%	26.1%	6.7%	7.1%
Southern Co.	7.6%	8.4%	54.9%	4.5%	1.1%	4.5%	44.0%	26.1%	5.7%	6.1%
Unitil Corp.	8.0%	8.7%	56.9%	5.0%	0.0%	5.0%	43.1%	26.1%	6.1%	6.5%
Edison Int'l	8.0%	8.7%	57.3%	5.0%	5.7%	5.0%	37.0%	26.1%	6.2%	6.6%
El Paso Electric	8.7%	9.2%	57.3%	-	0.0%	5.0%	42.7%	26.1%	6.5%	6.8%
IDACORP Inc.	8.0%	8.7%	65.4%	-	0.0%	5.0%	34.6%	26.1%	6.5%	6.9%
Pinnacle West Capital	8.0%	8.7%	63.5%	-	0.0%	4.5%	36.5%	26.1%	6.3%	6.7%
PNM Resources	8.7%	9.2%	50.8%	5.0%	0.2%	5.0%	49.0%	26.1%	6.2%	6.5%
Portland General	8.3%	8.9%	56.2%	-	0.0%	5.0%	43.8%	26.1%	6.3%	6.6%
Xcel Energy Inc.	7.6%	8.4%	56.6%	-	0.0%	4.5%	43.4%	26.1%	5.8%	6.2%
Proxy Group Average	8.2%	8.8%	59.7%	4.8%	0.4%	4.8%	39.9%	26.1%	6.3%	6.7%

Sources and Notes:

[1]: Table No. BV-10; Panel A, [4].
[2]: Table No. BV-10; Panel A, [5].
[3]: Table No. BV-4, [4].
[4]: Supporting Schedule #2 to Table No. BV-11, Pa
[5]: Table No. BV-4, [5].
[6]: Supporting Schedule #2 to Table No. BV-11, Panel B.
[7]: Table No. BV-4, [6].
[8]: Composite Federal and State Corporate Tax Rate.
[9]: ([1] x [3]) + ([4] x [5]) + {[6] x [7] x (1 - [8])}.
[10]: ([2] x [3]) + ([4] x [5]) + {[6] x [7] x (1 - [8])}.

Supporting Schedule #1 to Table No. BV-11

Panel A: Rating to Yield Conversion

Rating	Bond Yield	Preferred Yield
AA	4.3%	4.3%
A	4.5%	4.5%
BBB	5.0%	5.0%

Sources and Notes:
Bond Yields from Bloomberg as of November 30, 2018.
Preferred Yields from Matching Bloomberg bond yields as of Nov 30, 2018.
AA estimated as A - 0.5 * (BBB - A).

Supporting Schedule #1 to Table No. BV-11

Panel B: Bond Rating Summary

Company	November 30, 2018 [1]	3rd Quarter, 2018 [2]	3rd Quarter, 2018 [3]	3rd Quarter, 2018 [4]	3rd Quarter, 2018 [5]	3rd Quarter, 2018 [6]
ALLETE	BBB+	BBB+	BBB+	BBB+	BBB+	BBB+
Alliant Energy	A-	A-	A-	A-	A-	A-
Amer. Elec. Power	A-	A-	A-	BBB+	BBB	BBB
Ameren Corp.	BBB+	BBB+	BBB+	BBB+	BBB+	BBB+
CMS Energy Corp.	BBB+	BBB+	BBB+	BBB+	BBB+	BBB
DTE Energy	BBB+	BBB+	BBB+	BBB+	BBB+	BBB+
Entergy Corp.	BBB+	BBB+	BBB+	BBB+	BBB	BBB
MGE Energy	AA-	AA-	AA-	AA-	AA-	AA-
OGE Energy	BBB+	BBB+	A-	A-	A-	A-
Otter Tail Corp.	BBB	BBB	BBB	BBB	BBB	BBB
AVANGRID Inc.	BBB+	BBB+	BBB+	BBB+	na	na
Consol. Edison	A-	A-	A-	A-	A-	A-
Duke Energy	A-	A-	A-	A-	A-	BBB+
Eversource Energy	A+	A+	A	A	A	A-
NextEra Energy	A-	A-	A-	A-	A-	A-
PPL Corp.	A-	A-	A-	A-	A-	BBB
Public Serv. Enterprise	BBB+	BBB+	BBB+	BBB+	BBB+	BBB+
Southern Co.	A-	A-	A-	A-	A-	A
Unitil Corp.	BBB+	BBB+	BBB+	BBB+	BBB+	na
Edison Int'l	BBB+	BBB+	BBB+	BBB+	BBB+	BBB+
El Paso Electric	BBB	BBB	BBB	BBB	BBB	BBB
IDACORP Inc.	BBB	BBB	BBB	BBB	BBB	BBB
Pinnacle West Capital	A-	A-	A-	A-	A-	A-
PNM Resources	BBB+	BBB+	BBB+	BBB+	BBB	BBB
Portland General	BBB+	BBB+	BBB	BBB	BBB	BBB
Xcel Energy Inc.	A-	A-	A-	A-	A-	A-

Sources and Notes:
[1] - [6]: S&P Credit Ratings from Research Insight.

Supporting Schedule #1 to Table No. BV-11

Panel C: Preferred Equity Rating Summary

Company	November 30, 2018 [1]	3rd Quarter, 2018 [2]	3rd Quarter, 2018 [3]	3rd Quarter, 2018 [4]	3rd Quarter, 2018 [5]	3rd Quarter, 2018 [6]
ALLETE	-	-	-	-	-	-
Alliant Energy	A-	A-	A-	A-	A-	A-
Amer. Elec. Power	-	-	-	-	-	-
Ameren Corp.	-	-	-	-	-	-
CMS Energy Corp.	-	-	-	-	-	-
DTE Energy	-	-	-	-	-	-
Entergy Corp.	BBB+	BBE	BBE	BBE	BBE	BBB
MGE Energy	-	-	-	-	-	-
OGE Energy	-	-	-	-	-	-
Otter Tail Corp.	-	-	-	-	-	-
AVANGRID Inc.	-	-	-	-	na	na
Consol. Edison	-	-	-	-	-	-
Duke Energy	-	-	-	-	-	-
Eversource Energy	A+	A+	A	A	A	A-
NextEra Energy	-	-	-	-	-	-
PPL Corp.	-	-	-	-	-	-
Public Serv. Enterprise	-	-	-	-	-	-
Southern Co.	A-	A-	A-	A-	A-	A
Unitil Corp.	BBB+	BBE	BBE	BBE	BBE	na
Edison Int'l	BBB+	BBE	BBE	BBE	BBE	BBB+
El Paso Electric	-	-	-	-	-	-
IDACORP Inc.	-	-	-	-	-	-
Pinnacle West Capital	-	-	-	-	-	-
PNM Resources	BBB+	BBE	BBE	BBE	BBE	BBB
Portland General	-	-	-	-	-	-
Xcel Energy Inc.	-	-	-	-	-	-

Sources and Notes:
[1] - [6]: Preferred equity ratings are assumed equal to the company's bond ratings reported in Supporting Schedule #1 to Table No. BV-11, Panel B if the company has preferred equity.

Supporting Schedule #2 to Table No. BV-11

Panel A: 15-Day Average U.S. Utility Bond Yields and Preferred Yields

Date	A Rated Utility [1]	BBB Rated Utility [2]	A Preferred [3]	BBB Preferred [4]
11/30/2018	4.6%	5.0%	4.6%	5.0%
11/29/2018	4.6%	5.0%	4.6%	5.0%
11/28/2018	4.6%	5.0%	4.6%	5.0%
11/27/2018	4.5%	5.0%	4.5%	5.0%
11/26/2018	4.5%	4.9%	4.5%	4.9%
11/23/2018	4.5%	4.9%	4.5%	4.9%
11/22/2018	4.5%	4.9%	4.5%	4.9%
11/21/2018	4.5%	4.9%	4.5%	4.9%
11/20/2018	4.5%	4.9%	4.5%	4.9%
11/19/2018	4.5%	4.9%	4.5%	4.9%
11/16/2018	4.5%	4.9%	4.5%	4.9%
11/15/2018	4.5%	5.0%	4.5%	5.0%
11/14/2018	4.5%	5.0%	4.5%	5.0%
11/13/2018	4.5%	5.0%	4.5%	5.0%
11/12/2018	4.6%	5.1%	4.6%	5.1%
Average	4.5%	5.0%	4.5%	5.0%

Sources and Notes:
[1] - [2]: Bloomberg as of November 30, 2018.
[3] - [4]: From Matching Bloomberg bond yields as of Nov 30, 2018.

Supporting Schedule #2 to Table No. BV-11

Panel B: Bond Yield Summary

Company	November 30, 2018 [1]	3rd Quarter, 2018 [2]	3rd Quarter, 2017 [3]	3rd Quarter, 2016 [4]	3rd Quarter, 2015 [5]	3rd Quarter, 2014 [6]	5-Year Average [7]
ALLETE	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Alliant Energy	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%
Amer. Elec. Power	4.5%	4.5%	4.5%	5.0%	5.0%	5.0%	4.8%
Ameren Corp.	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
CMS Energy Corp.	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
DTE Energy	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Entergy Corp.	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
MGE Energy	4.3%	4.3%	4.3%	4.3%	4.3%	4.3%	4.3%
OGE Energy	5.0%	5.0%	4.5%	4.5%	4.5%	4.5%	4.6%
Otter Tail Corp.	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
AVANGRID Inc.	5.0%	5.0%	5.0%	5.0%	NA	NA	5.0%
Consol. Edison	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%
Duke Energy	4.5%	4.5%	4.5%	4.5%	4.5%	5.0%	4.6%
Eversource Energy	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%
NextEra Energy	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%
PPL Corp.	4.5%	4.5%	4.5%	4.5%	4.5%	5.0%	4.6%
Public Serv. Enterprise	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Southern Co.	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%
Unitil Corp.	5.0%	5.0%	5.0%	5.0%	5.0%	NA	5.0%
Edison Int'l	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
El Paso Electric	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
IDACORP Inc.	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Pinnacle West Capital	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%
PNM Resources	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Portland General	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Xcel Energy Inc.	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%

Sources and Notes:
[1] - [6]: Ratings based on Supporting Schedule #1 to Table No. BV-11, Panel B. Bond yields from Bloomberg as of November 30, 2018.
[7]: Average of [2] through [6].
AA estimated as A - 0.5 * (BBB - A).

Supporting Schedule #2 to Table No. BV-11

Panel C: Preferred Equity Yield Summary

Company	November 30, 2018 [1]	3rd Quarter, 2018 [2]	3rd Quarter, 2017 [3]	3rd Quarter, 2016 [4]	3rd Quarter, 2015 [5]	3rd Quarter, 2014 [6]	5-Year Average [7]
ALLETE	-	-	-	-	-	-	-
Alliant Energy	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%
Amer. Elec. Power	-	-	-	-	-	-	-
Ameren Corp.	-	-	-	-	-	-	-
CMS Energy Corp.	-	-	-	-	-	-	-
DTE Energy	-	-	-	-	-	-	-
Entergy Corp.	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
MGE Energy	-	-	-	-	-	-	-
OGE Energy	-	-	-	-	-	-	-
Otter Tail Corp.	-	-	-	-	-	-	-
AVANGRID Inc.	-	-	-	-	-	-	-
Consol. Edison	-	-	-	-	-	-	-
Duke Energy	-	-	-	-	-	-	-
Eversource Energy	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%
NextEra Energy	-	-	-	-	-	-	-
PPL Corp.	-	-	-	-	-	-	-
Public Serv. Enterprise	-	-	-	-	-	-	-
Southern Co.	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%
Unitil Corp.	5.0%	5.0%	5.0%	5.0%	5.0%	-	5.0%
Edison Int'l	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
El Paso Electric	-	-	-	-	-	-	-
IDACORP Inc.	-	-	-	-	-	-	-
Pinnacle West Capital	-	-	-	-	-	-	-
PNM Resources	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Portland General	-	-	-	-	-	-	-
Xcel Energy Inc.	-	-	-	-	-	-	-

Sources and Notes:

[1] - [6]: See Supporting Schedule #1 to Table No. BV-11, Panel C. Preferred equity yields are from Matching Bloomberg bond yields as of Nov 30, 2018.

[7]: Average of [2] through [6].

AA estimated as A - 0.5 * (BBB - A).

Table No. BV-12

Risk Positioning Cost of Equity at Con Edison's Regulatory Capital Structure

	Overall After-Tax Cost of Capital [1]	Con Edison Regulatory % Debt [2]	Representative Cost of A-Rated Utility Debt [3]	Con Edison Income Tax Rate [4]	Con Edison Regulatory % Equity [5]	Estimated Return on Equity [6]
CAPM	6.3%	50.0%	4.5%	26.1%	50.0%	9.3%
ECAPM (1.50%)	6.7%	50.0%	4.5%	26.1%	50.0%	10.0%

Sources and Notes:
[1]: Table No. BV-11; Panel A, [9] - [10]. Long-Term Risk Free Rate of 4.10%, Long-Term Market Risk Premium of 7.07%.
[2]: Con Edison Regulatory Capital Structure.
[3]: Based on a A rating. Yield from Bloomberg as of November 30, 2018.
[4]: Composite Federal and State Corporate Tax Rate.
[5]: Con Edison Regulatory Capital Structure.
[6]: {[1] - ([2] x [3] x (1 - [4])}/ [5].

Table No. BV-13

Hamada Procedure to Obtain Unlevered Asset Beta

Company	ValueLine Beta [1]	Debt Beta [2]	5-Year Average Common Equity to Market Value Ratio [3]	5-Year Average Preferred Equity to Market Value Ratio [4]	5-Year Average Debt to Market Value Ratio [5]	Con Edison Income Tax Rate [6]	Asset Beta: Without Taxes [7]	Asset Beta: With Taxes [8]
ALLETE	0.65	0.10	64.0%	0.0%	36.0%	26.1%	0.45	0.49
Alliant Energy	0.60	0.05	60.9%	1.7%	37.3%	26.1%	0.39	0.42
Amer. Elec. Power	0.55	0.08	56.8%	0.0%	43.2%	26.1%	0.35	0.38
Ameren Corp.	0.55	0.10	59.6%	0.0%	40.4%	26.1%	0.37	0.40
CMS Energy Corp.	0.55	0.10	50.9%	0.0%	49.1%	26.1%	0.33	0.36
DTE Energy	0.55	0.10	60.0%	0.0%	40.0%	26.1%	0.37	0.40
Entergy Corp.	0.60	0.10	47.8%	0.9%	51.4%	26.1%	0.34	0.38
MGE Energy	0.60	0.05	78.8%	0.0%	21.2%	26.1%	0.48	0.51
OGE Energy	0.85	0.06	69.6%	0.0%	30.4%	26.1%	0.61	0.66
Otter Tail Corp.	0.75	0.10	68.5%	0.0%	31.5%	26.1%	0.55	0.59
AVANGRID Inc.	0.30	0.10	70.2%	0.0%	29.8%	26.1%	0.24	0.25
Consol. Edison	0.40	0.05	58.0%	0.0%	42.0%	26.1%	0.25	0.28
Duke Energy	0.50	0.06	52.6%	0.0%	47.4%	26.1%	0.29	0.32
Eversource Energy	0.60	0.05	60.6%	0.6%	38.8%	26.1%	0.38	0.42
NextEra Energy	0.55	0.05	61.6%	0.0%	38.4%	26.1%	0.36	0.39
PPL Corp.	0.70	0.06	48.9%	0.0%	51.1%	26.1%	0.37	0.42
Public Serv. Enterprise	0.60	0.10	64.9%	0.0%	35.1%	26.1%	0.42	0.46
Southern Co.	0.50	0.05	54.9%	1.1%	44.0%	26.1%	0.30	0.33
Unitil Corp.	0.55	0.10	56.9%	0.0%	43.1%	26.1%	0.36	0.39
Edison Int'l	0.55	0.10	57.3%	5.7%	37.0%	26.1%	0.36	0.39
El Paso Electric	0.65	0.10	57.3%	0.0%	42.7%	26.1%	0.41	0.45
IDACORP Inc.	0.55	0.10	65.4%	0.0%	34.6%	26.1%	0.39	0.42
Pinnacle West Capital	0.55	0.05	63.5%	0.0%	36.5%	26.1%	0.37	0.40
PNM Resources	0.65	0.10	50.8%	0.2%	49.0%	26.1%	0.38	0.42
Portland General	0.60	0.10	56.2%	0.0%	43.8%	26.1%	0.38	0.42
Xcel Energy Inc.	0.50	0.05	56.6%	0.0%	43.4%	26.1%	0.30	0.34
Proxy Group Average	0.58	0.08	59.7%	0.4%	39.9%	26.1%	0.38	0.41

Sources and Notes:

[1]: Supporting Schedule # 1 to Table No. BV-10, [1].
[2]: Supporting Schedule #1 to Table No. BV-13, [7].
[3]: Table No. BV-4, [4].
[4]: Table No. BV-4, [5].
[5]: Table No. BV-4, [6].
[6]: Composite Federal and State Corporate Tax Rate
[7]: [1]*[3] + [2]*([4] + [5]).
[8]: {[1]*[3] + [2]*([4]+[5]*(1-[6]))} / {[3] + [4] + [5]*(1 -[6])}.

Supporting Schedule #1 to Table No. BV-13

Debt Beta Summary

Company	November 30, 2018 [1]	3rd Quarter, 2018 [2]	3rd Quarter, 2017 [3]	3rd Quarter, 2016 [4]	3rd Quarter, 2015 [5]	3rd Quarter, 2014 [6]	5-Year Average [7]
ALLETE	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Alliant Energy	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Amer. Elec. Power	0.05	0.05	0.05	0.10	0.10	0.10	0.08
Ameren Corp.	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CMS Energy Corp.	0.10	0.10	0.10	0.10	0.10	0.10	0.10
DTE Energy	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Entergy Corp.	0.10	0.10	0.10	0.10	0.10	0.10	0.10
MGE Energy	0.05	0.05	0.05	0.05	0.05	0.05	0.05
OGE Energy	0.10	0.10	0.05	0.05	0.05	0.05	0.06
Otter Tail Corp.	0.10	0.10	0.10	0.10	0.10	0.10	0.10
AVANGRID Inc.	0.10	0.10	0.10	0.10	NA	NA	0.10
Consol. Edison	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Duke Energy	0.05	0.05	0.05	0.05	0.05	0.10	0.06
Eversource Energy	0.05	0.05	0.05	0.05	0.05	0.05	0.05
NextEra Energy	0.05	0.05	0.05	0.05	0.05	0.05	0.05
PPL Corp.	0.05	0.05	0.05	0.05	0.05	0.10	0.06
Public Serv. Enterprise	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Southern Co.	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Unitil Corp.	0.10	0.10	0.10	0.10	0.10	NA	0.10
Edison Int'l	0.10	0.10	0.10	0.10	0.10	0.10	0.10
El Paso Electric	0.10	0.10	0.10	0.10	0.10	0.10	0.10
IDACORP Inc.	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Pinnacle West Capital	0.05	0.05	0.05	0.05	0.05	0.05	0.05
PNM Resources	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Portland General	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Xcel Energy Inc.	0.05	0.05	0.05	0.05	0.05	0.05	0.05

Sources and Notes:

[1] - [6]: Ratings based on Supporting Schedule #1 to Table No. BV-11, Panel B. Debt Betas are from Corporate Finance, Berk and Demarzo, Third Edition, p. 413.

[7]: Average of [2] through [6].

Table No. BV-14

Sample Average Asset Beta Relevered at Con Edison's Regulatory Capital Structure

	Asset Beta [1]	Debt Beta [2]	Con Edison Regulatory % Debt [3]	Con Edison Income Tax Rate [4]	Con Edison Regulatory % Equity [5]	Estimated Equity Beta [6]
Asset Beta Without Taxes	0.38	0.05	50.0%	26.1%	50.0%	0.70
Asset Beta With Taxes	0.41	0.05	50.0%	26.1%	50.0%	0.68

Sources and Notes:

[1]: Table No. BV-13, [7] - [8].

[2]: Debt Beta estimate for A rated entities. Corporate Finance, Berk and Demarzo, Third Edition, p. 413.

[3]: Con Edison Regulatory Capital Structure.

[4]: Composite Federal and State Corporate Tax Rate.

[5]: Con Edison Regulatory Capital Structure.

[6]: [1] + [3]/[5]*([1] - [2]) without taxes, [1] + [3]*(1 - [4])/[5]*([1] - [2]) with taxes.

Table No. BV-15

Risk-Positioning Cost of Equity using Hamada Procedure

Long-Term Risk Free Rate of 4.10%, Long-Term Market Risk Premium of 7.07%

	Long-Term Risk-Free Rate [1]	Hamada Re-levered Equity Beta [2]	Long-Term Market Risk Premium [3]	CAPM Cost of Equity [4]	ECAPM (1.5%) Cost of Equity [5]
Asset Beta Without Taxes	4.1%	0.70	7.1%	9.1%	9.5%
Asset Beta With Taxes	4.1%	0.68	7.1%	8.9%	9.4%

Sources and Notes:
[1]: Villadsen Direct Evidence.
[2]: Table No. BV-14, [6].
[3]: Villadsen Direct Evidence.
[4]: [1] + ([2] x [3]).
[5]: ([1] + 1.5%) + [2] x ([3] - 1.5%).

Risk Premiums Determined by Relationship Between Authorized ROEs[1] and Long-term Treasury Bond Rates During the Period 1990 - 2018
Electric Utilities

Risk Premium = A_0 + (A_1 x Treasury Bond Rate)

R Squared	0.829
Estimate of Intercept (A_0)	8.48%
Estimate of Slope (A_1)	-0.542

Predicted Risk Premium		Exp. Treasury Bond Rate[2]		Est. Cost of Equity
6.26%	+	4.10%	=	10.36%

Sources and Notes:

[1]: Authorized ROE Data from SNL financial as of 12/07/2018.

[2]: Blue Chip consensus forecast 2018 10 year T-bill yield + maturity premium between 10 year and 20 year U.S. Government bonds.

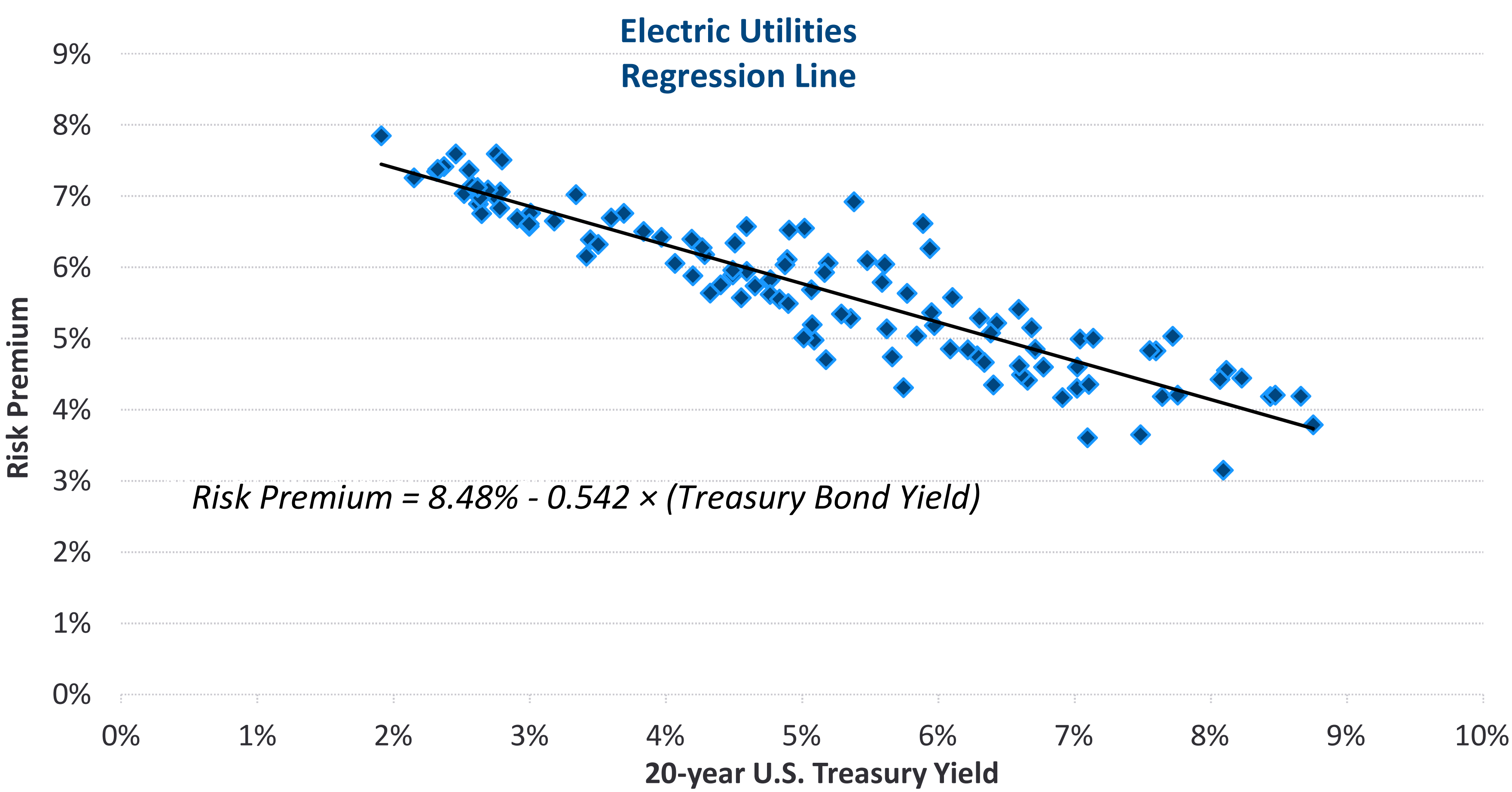
See SS1-Regression Results for derivation of regression coefficients A_0 and A_1

Regression Results

Electric Utilities

	Slope	Intercept
Coefficient	-0.542	0.085
Standard Error	0.023	0.001
R Squared	0.829	-

Note: Estimated by regressing Risk Premium on 20 year Treasury Bond Yield.



Source: Bloomberg for Treasury Bond Yields, SNL Financial for authorized RoE data.

Quarterly Risk Premiums for Electric Utilities

1990 - 2018

Quarter	Average Authorized Return on Equity [1]	20 year Treasury Bond Yield [2]	Risk Premium [3] = [1] - [2]
1990 Q1	12.62%	8.44%	4.19%
1990 Q2	12.85%	8.66%	4.19%
1990 Q3	12.54%	8.75%	3.79%
1990 Q4	12.68%	8.47%	4.21%
1991 Q1	12.66%	8.11%	4.55%
1991 Q2	12.67%	8.23%	4.44%
1991 Q3	12.49%	8.07%	4.43%
1991 Q4	12.42%	7.60%	4.83%
1992 Q1	12.38%	7.55%	4.83%
1992 Q2	11.83%	7.64%	4.18%
1992 Q3	12.03%	7.04%	4.99%
1992 Q4	12.14%	7.14%	5.00%
1993 Q1	11.84%	6.68%	5.15%
1993 Q2	11.64%	6.43%	5.21%
1993 Q3	11.15%	5.97%	5.18%
1993 Q4	11.04%	6.28%	4.76%
1994 Q1	11.07%	6.65%	4.41%
1994 Q2	11.13%	7.48%	3.65%
1994 Q3	12.75%	7.72%	5.03%
1994 Q4	11.24%	8.09%	3.15%
1995 Q1	11.96%	7.76%	4.20%
1995 Q2	11.32%	7.02%	4.30%
1995 Q3	11.37%	6.77%	4.60%
1995 Q4	11.58%	6.30%	5.28%
1996 Q1	11.46%	6.38%	5.08%
1996 Q2	11.46%	7.10%	4.36%
1996 Q3	10.70%	7.09%	3.61%
1996 Q4	11.56%	6.71%	4.85%
1997 Q1	11.08%	6.91%	4.17%
1997 Q2	11.62%	7.02%	4.60%
1997 Q3	12.00%	6.59%	5.41%
1997 Q4	11.06%	6.22%	4.84%
1998 Q1	11.31%	5.95%	5.36%
1998 Q2	12.20%	5.94%	6.26%
1998 Q3	11.65%	5.61%	6.04%
1998 Q4	12.30%	5.38%	6.92%
1999 Q1	10.40%	5.66%	4.74%
1999 Q2	10.94%	6.09%	4.85%
1999 Q3	10.75%	6.40%	4.35%
1999 Q4	11.10%	6.61%	4.49%

Quarterly Risk Premiums for Electric Utilities

1990 - 2018

Quarter	Average Authorized Return on Equity [1]	20 year Treasury Bond Yield [2]	Risk Premium [3] = [1] - [2]
2000 Q1	11.21%	6.59%	4.62%
2000 Q2	11.00%	6.34%	4.66%
2000 Q3	11.68%	6.10%	5.58%
2000 Q4	12.50%	5.89%	6.61%
2001 Q1	11.38%	5.59%	5.79%
2001 Q2	10.88%	5.84%	5.04%
2001 Q3	10.76%	5.62%	5.14%
2001 Q4	11.57%	5.48%	6.09%
2002 Q1	10.05%	5.74%	4.31%
2002 Q2	11.41%	5.77%	5.64%
2002 Q3	11.25%	5.19%	6.06%
2002 Q4	11.57%	5.02%	6.55%
2003 Q1	11.43%	4.90%	6.52%
2003 Q2	11.16%	4.59%	6.57%
2003 Q3	9.88%	5.17%	4.70%
2003 Q4	11.09%	5.16%	5.93%
2004 Q1	11.00%	4.89%	6.11%
2004 Q2	10.64%	5.36%	5.28%
2004 Q3	10.75%	5.07%	5.68%
2004 Q4	10.91%	4.87%	6.04%
2005 Q1	10.56%	4.76%	5.80%
2005 Q2	10.13%	4.55%	5.57%
2005 Q3	10.85%	4.51%	6.34%
2005 Q4	10.59%	4.77%	5.83%
2006 Q1	10.38%	4.76%	5.62%
2006 Q2	10.63%	5.29%	5.34%
2006 Q3	10.06%	5.09%	4.98%
2006 Q4	10.39%	4.83%	5.55%
2007 Q1	10.39%	4.90%	5.49%
2007 Q2	10.27%	5.07%	5.19%
2007 Q3	10.02%	5.01%	5.01%
2007 Q4	10.39%	4.65%	5.74%
2008 Q1	10.15%	4.40%	5.75%
2008 Q2	10.54%	4.59%	5.94%
2008 Q3	10.38%	4.49%	5.89%
2008 Q4	10.39%	3.97%	6.42%
2009 Q1	10.45%	3.69%	6.76%
2009 Q2	10.58%	4.19%	6.39%
2009 Q3	10.46%	4.28%	6.18%
2009 Q4	10.54%	4.27%	6.28%
2010 Q1	10.45%	4.49%	5.96%
2010 Q2	10.08%	4.20%	5.88%
2010 Q3	10.29%	3.60%	6.69%
2010 Q4	10.34%	3.84%	6.50%
2011 Q1	9.96%	4.32%	5.64%
2011 Q2	10.12%	4.07%	6.05%
2011 Q3	10.36%	3.34%	7.02%
2011 Q4	10.34%	2.75%	7.59%

Quarterly Risk Premiums for Electric Utilities

1990 - 2018

Quarter	Average Authorized Return on Equity	20 year Treasury Bond Yield	Risk Premium
	[1]	[2]	[3] = [1] - [2]
2012 Q1	10.30%	2.80%	7.51%
2012 Q2	9.92%	2.55%	7.36%
2012 Q3	9.78%	2.37%	7.41%
2012 Q4	10.05%	2.46%	7.59%
2013 Q1	9.74%	2.75%	6.99%
2013 Q2	9.84%	2.78%	7.06%
2013 Q3	9.83%	3.44%	6.39%
2013 Q4	9.82%	3.50%	6.32%
2014 Q1	9.57%	3.42%	6.16%
2014 Q2	9.83%	3.18%	6.65%
2014 Q3	9.77%	3.01%	6.76%
2014 Q4	9.78%	2.69%	7.08%
2015 Q1	9.66%	2.32%	7.34%
2015 Q2	9.51%	2.62%	6.89%
2015 Q3	9.40%	2.65%	6.75%
2015 Q4	9.65%	2.60%	7.05%
2016 Q1	9.70%	2.32%	7.38%
2016 Q2	9.41%	2.15%	7.26%
2016 Q3	9.76%	1.91%	7.85%
2016 Q4	9.55%	2.52%	7.04%
2017 Q1	9.61%	2.78%	6.83%
2017 Q2	9.61%	2.64%	6.97%
2017 Q3	9.73%	2.58%	7.15%
2017 Q4	9.74%	2.62%	7.12%
2018 Q1	9.59%	2.91%	6.68%
2018 Q2	9.57%	3.00%	6.58%
2018 Q3	9.61%	3.00%	6.61%

Sources:
[1]: SNL Financial as of 12/07/2018.
[2]: Bloomberg as of 11/30/2018.

Risk Premiums Determined by Relationship Between Authorized ROEs[1] and Long-term Treasury Bond Rates During the Period 1990 - 2018
Electric Distribution Utilities

Risk Premium = A_0 + (A_1 x Treasury Bond Rate)

R Squared	0.877
Estimate of Intercept (A_0)	8.87%
Estimate of Slope (A_1)	-0.762

Predicted Risk Premium		Exp. Treasury Bond Rate[2]		Est. Cost of Equity
5.75%	+	4.10%	=	9.85%

Sources and Notes:

[1]: Authorized ROE Data from SNL financial as of 12/07/2018.

[2]: Blue Chip consensus forecast 2018 10 year T-bill yield + maturity premium between 10 year and 20 year U.S. Government bonds.

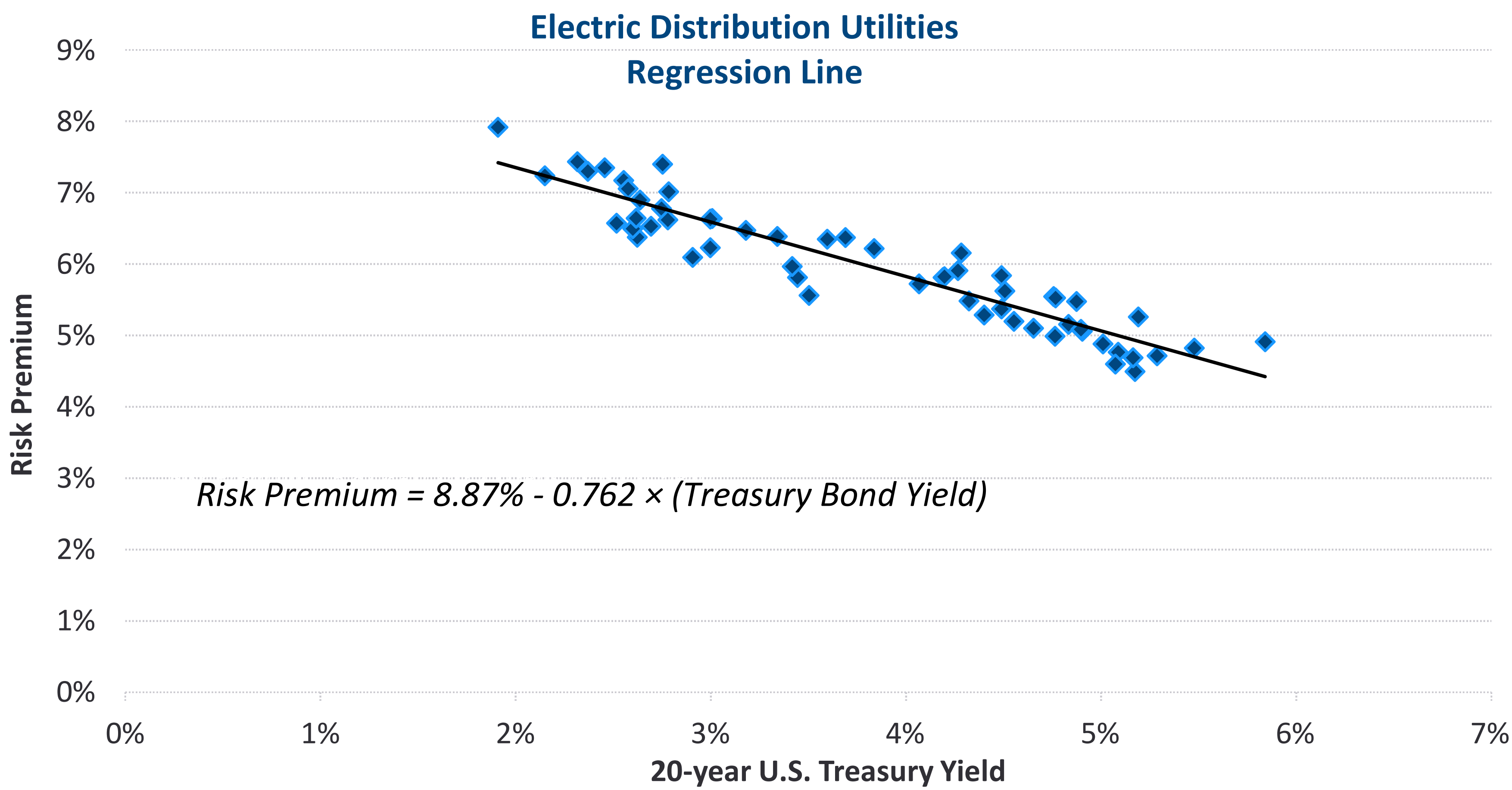
See SS1-Regression Results for derivation of regression coefficients A_0 and A_1

Regression Results

Electric Distribution Utilities

	Slope	Intercept
Coefficient	-0.762	0.089
Standard Error	0.039	0.002
R Squared	0.877	-

Note: Estimated by regressing Risk Premium on 20 year Treasury Bond Yield.



Source: Bloomberg for Treasury Bond Yields, SNL Financial for authorized RoE data.

Quarterly Risk Premiums for Electric Distribution Utilities

1990 - 2018

Quarter	Average Authorized Return on Equity [1]	20 year Treasury Bond Yield [2]	Risk Premium [3] = [1] - [2]
1990 Q1	-	8.44%	-
1990 Q2	-	8.66%	-
1990 Q3	-	8.75%	-
1990 Q4	-	8.47%	-
1991 Q1	-	8.11%	-
1991 Q2	-	8.23%	-
1991 Q3	-	8.07%	-
1991 Q4	-	7.60%	-
1992 Q1	-	7.55%	-
1992 Q2	-	7.64%	-
1992 Q3	-	7.04%	-
1992 Q4	-	7.14%	-
1993 Q1	-	6.68%	-
1993 Q2	-	6.43%	-
1993 Q3	-	5.97%	-
1993 Q4	-	6.28%	-
1994 Q1	-	6.65%	-
1994 Q2	-	7.48%	-
1994 Q3	-	7.72%	-
1994 Q4	-	8.09%	-
1995 Q1	-	7.76%	-
1995 Q2	-	7.02%	-
1995 Q3	-	6.77%	-
1995 Q4	-	6.30%	-
1996 Q1	-	6.38%	-
1996 Q2	-	7.10%	-
1996 Q3	-	7.09%	-
1996 Q4	-	6.71%	-
1997 Q1	-	6.91%	-
1997 Q2	-	7.02%	-
1997 Q3	-	6.59%	-
1997 Q4	-	6.22%	-
1998 Q1	-	5.95%	-
1998 Q2	-	5.94%	-
1998 Q3	-	5.61%	-
1998 Q4	-	5.38%	-
1999 Q1	-	5.66%	-
1999 Q2	-	6.09%	-
1999 Q3	-	6.40%	-
1999 Q4	-	6.61%	-

Quarterly Risk Premiums for Electric Distribution Utilities

1990 - 2018

Quarter	Average Authorized Return on Equity [1]	20 year Treasury Bond Yield [2]	Risk Premium [3] = [1] - [2]
2000 Q1	-	6.59%	-
2000 Q2	-	6.34%	-
2000 Q3	-	6.10%	-
2000 Q4	-	5.89%	-
2001 Q1	-	5.59%	-
2001 Q2	10.75%	5.84%	4.91%
2001 Q3	-	5.62%	-
2001 Q4	10.30%	5.48%	4.82%
2002 Q1	-	5.74%	-
2002 Q2	-	5.77%	-
2002 Q3	10.45%	5.19%	5.26%
2002 Q4	-	5.02%	-
2003 Q1	9.96%	4.90%	5.06%
2003 Q2	-	4.59%	-
2003 Q3	9.67%	5.17%	4.49%
2003 Q4	9.85%	5.16%	4.69%
2004 Q1	-	4.89%	-
2004 Q2	-	5.36%	-
2004 Q3	-	5.07%	-
2004 Q4	10.35%	4.87%	5.48%
2005 Q1	10.30%	4.76%	5.54%
2005 Q2	9.75%	4.55%	5.20%
2005 Q3	10.13%	4.51%	5.62%
2005 Q4	10.29%	4.77%	5.52%
2006 Q1	9.75%	4.76%	4.99%
2006 Q2	10.00%	5.29%	4.71%
2006 Q3	9.85%	5.09%	4.76%
2006 Q4	9.99%	4.83%	5.15%
2007 Q1	9.98%	4.90%	5.09%
2007 Q2	9.67%	5.07%	4.60%
2007 Q3	9.89%	5.01%	4.88%
2007 Q4	9.75%	4.65%	5.10%
2008 Q1	9.69%	4.40%	5.29%
2008 Q2	-	4.59%	-
2008 Q3	10.33%	4.49%	5.84%
2008 Q4	-	3.97%	-
2009 Q1	10.06%	3.69%	6.37%
2009 Q2	10.00%	4.19%	5.81%
2009 Q3	10.44%	4.28%	6.16%
2009 Q4	10.18%	4.27%	5.91%
2010 Q1	9.86%	4.49%	5.37%
2010 Q2	10.02%	4.20%	5.82%
2010 Q3	9.94%	3.60%	6.35%
2010 Q4	10.06%	3.84%	6.22%
2011 Q1	9.81%	4.32%	5.48%
2011 Q2	9.79%	4.07%	5.72%
2011 Q3	9.73%	3.34%	6.39%
2011 Q4	10.15%	2.75%	7.40%

Quarterly Risk Premiums for Electric Distribution Utilities

1990 - 2018

Quarter	Average Authorized Return on Equity [1]	20 year Treasury Bond Yield [2]	Risk Premium [3] = [1] - [2]
2012 Q1	-	2.80%	-
2012 Q2	9.73%	2.55%	7.17%
2012 Q3	9.67%	2.37%	7.30%
2012 Q4	9.80%	2.46%	7.35%
2013 Q1	9.53%	2.75%	6.78%
2013 Q2	9.80%	2.78%	7.01%
2013 Q3	9.26%	3.44%	5.81%
2013 Q4	9.06%	3.50%	5.56%
2014 Q1	9.38%	3.42%	5.97%
2014 Q2	9.65%	3.18%	6.47%
2014 Q3	9.64%	3.01%	6.64%
2014 Q4	9.22%	2.69%	6.53%
2015 Q1	9.75%	2.32%	7.43%
2015 Q2	9.00%	2.62%	6.38%
2015 Q3	-	2.65%	-
2015 Q4	9.09%	2.60%	6.49%
2016 Q1	-	2.32%	-
2016 Q2	9.39%	2.15%	7.24%
2016 Q3	9.83%	1.91%	7.92%
2016 Q4	9.09%	2.52%	6.57%
2017 Q1	9.40%	2.78%	6.62%
2017 Q2	9.53%	2.64%	6.90%
2017 Q3	9.63%	2.58%	7.06%
2017 Q4	9.26%	2.62%	6.64%
2018 Q1	9.00%	2.91%	6.09%
2018 Q2	9.23%	3.00%	6.23%
2018 Q3	9.63%	3.00%	6.63%

Sources:
[1]: SNL Financial as of 12/07/2018.
[2]: Bloomberg as of 11/30/2018.

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
VOLUME FORECASTING MODELS

SC 1 (RESIDENTIAL AND RELIGIOUS)

Dependent Variable: DLOG(GWH01/BDA0,0,4)
Method: ARMA Maximum Likelihood (OPG - BHHH)
Sample: 1993Q4 2018Q3
Included observations: 100
Convergence achieved after 28 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.003301	0.018260	0.180781	0.8569
DLOG(PRICE01(-3),0,4)	-0.078212	0.024132	-3.240959	0.0017
DLOG(DPYR(-1),0,4)	0.142367	0.122003	1.166919	0.2463
D(WCDD0/BDA0,0,4)	0.000323	4.73E-05	6.831931	0.0000
D(WCDD3/BDA0,0,4)	0.000289	5.55E-05	5.198515	0.0000
D(WHDD0/BDA0,0,4)	7.57E-05	1.67E-05	4.536084	0.0000
AR(1)	0.985674	0.029095	33.87760	0.0000
MA(1)	-0.765725	0.085229	-8.984328	0.0000
SMA(4)	-0.505657	0.097943	-5.162770	0.0000
SIGMASQ	0.000389	6.81E-05	5.714200	0.0000

R-squared	0.880680	Mean dependent var	0.011825
Adjusted R-squared	0.868748	S.D. dependent var	0.057413
S.E. of regression	0.020800	Akaike info criterion	-4.794128
Sum squared resid	0.038937	Schwarz criterion	-4.533611
Log likelihood	249.7064	Hannan-Quinn criter.	-4.688692
F-statistic	73.80847	Durbin-Watson stat	1.949540
Prob(F-statistic)	0.000000		

Inverted AR Roots	0.99			
Inverted MA Roots	0.84	0.77	.00-.84i	-.00+.84i
	-0.84			

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
VOLUME FORECASTING MODELS

SC 2 (GENERAL - SMALL)

Dependent Variable: DLOG(GWH02/BDA0,0,4)
Method: ARMA Maximum Likelihood (OPG - BHHH)
Sample: 1993Q4 2018Q3
Included observations: 100
Convergence achieved after 11 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(PRICE02(-3),0,4)	-0.023433	0.024725	-0.947755	0.3457
DLOG(PNEMP_N,0,4)	0.081372	0.062742	1.296926	0.1979
DLOG(NC02,0,4)	0.542319	0.078183	6.936488	0.0000
D(WCDD0/BDA0,0,4)	0.000246	0.000018	13.79144	0.0000
D(WHDD0/BDA0,0,4)	7.48E-05	9.57E-06	7.815846	0.0000
AR(1)	0.193093	0.115304	1.674638	0.0974
SAR(4)	-0.357887	0.089729	-3.988531	0.0001
SIGMASQ	0.000207	3.08E-05	6.733340	0.0000

R-squared	0.825686	Mean dependent var	0.007873
Adjusted R-squared	0.812423	S.D. dependent var	0.034643
S.E. of regression	0.015004	Akaike info criterion	-5.478553
Sum squared resid	0.020711	Schwarz criterion	-5.270139
Log likelihood	281.9276	Hannan-Quinn criter.	-5.394204
Durbin-Watson stat	2.026608		

Inverted AR Roots	.55-.55i	.55+.55i	0.19	-.55+.55i
	-.55+.55i			

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
VOLUME FORECASTING MODELS

SC 8 (MULTIPLE DWELLINGS - REDISTRIBUTION)

Dependent Variable: DLOG(GWH08/(BDA0),0,4)
Method: ARMA Maximum Likelihood (OPG - BHHH)
Sample: 1993Q4 2018Q3
Included observations: 100
Convergence achieved after 21 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(PRICE08(-4),0,4)	-0.040177	0.021089	-1.905081	0.0599
D(WCDD0/BDA0,0,4)	0.000374	0.000045	8.351490	0.0000
D(WCDD3/BDA0,0,4)	0.000117	4.73E-05	2.472509	0.0152
D(WHDD0/BDA0,0,4)	4.86E-05	1.23E-05	3.964754	0.0001
AR(1)	0.983326	0.034508	28.49583	0.0000
MA(1)	-0.855616	0.085063	-10.05863	0.0000
SIGMASQ	0.000379	0.000053	7.163205	0.0000

R-squared	0.830715	Mean dependent var	0.003548
Adjusted R-squared	0.819794	S.D. dependent var	0.047561
S.E. of regression	0.020190	Akaike info criterion	-4.889386
Sum squared resid	0.037910	Schwarz criterion	-4.707024
Log likelihood	251.4693	Hannan-Quinn criter.	-4.815581
Durbin-Watson stat	1.733555		

Inverted AR Roots	0.98
Inverted MA Roots	0.86

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
VOLUME FORECASTING MODELS

SC 9 (GENERAL - LARGE)

Dependent Variable: DLOG((GWH09)/BDA0,0,4)
Method: ARMA Maximum Likelihood (OPG - BHHH)
Sample: 1993Q4 2018Q3
Included observations: 100
Convergence achieved after 149 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.027813	0.006906	-4.027654	0.0001
DLOG(PRICE09(-2),0,4)	-0.014932	0.013214	-1.129998	0.2615
DLOG(PNEMP_N,0,4)	0.426561	0.120325	3.545062	0.0006
DLOG(NC09,0,4)	1.263250	0.215804	5.853683	0.0000
D1997Q2	0.014730	0.004792	3.074151	0.0028
D(WCDD0/BDA0,0,4)	0.000184	1.40E-05	13.17780	0.0000
D(WHDD0/BDA0,0,4)	3.42E-05	6.05E-06	5.652904	0.0000
AR(1)	0.833176	0.126164	6.603898	0.0000
MA(1)	-0.441798	0.183516	-2.407409	0.0181
SMA(4)	-0.563516	0.124446	-4.528179	0.0000
SIGMASQ	9.08E-05	0.000015	6.121075	0.0000

R-squared	0.855148	Mean dependent var	0.010333
Adjusted R-squared	0.838872	S.D. dependent var	0.025159
S.E. of regression	0.010099	Akaike info criterion	-6.235061
Sum squared resid	0.009077	Schwarz criterion	-5.948492
Log likelihood	322.7530	Hannan-Quinn criter.	-6.119081
F-statistic	52.54200	Durbin-Watson stat	1.877559
Prob(F-statistic)	0.000000		

Inverted AR Roots	0.83			
Inverted MA Roots	0.87	0.44	-.00+.87i	-.00-.87i
	-0.87			

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
VOLUME FORECASTING MODELS

SC 12 (MULTIPLE DWELLING SPACE HEATING)

Dependent Variable: DLOG(GWH12,0,12)
Method: ARMA Maximum Likelihood (OPG - BHHH)
Sample: 1993M10 2018M09
Included observations: 300
Convergence achieved after 12 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.013356	0.005202	-2.567512	0.0107
D(CDD0,0,12)	0.000362	9.39E-05	3.857843	0.0001
D(CDD0(-1),0,12)	0.000439	9.85E-05	4.460330	0.0000
D(HDD0,0,12)	0.000374	5.10E-05	7.325253	0.0000
D(HDD0(-1),0,12)	0.000572	4.64E-05	12.30827	0.0000
DLOG(NC12,0,12)	0.206011	0.359729	0.572684	0.5673
D(D201305,0,12)	0.357483	0.073276	4.878556	0.0000
D2013M11	0.161761	0.029135	5.552172	0.0000
AR(1)	0.130736	0.056865	2.299048	0.0222
AR(2)	0.156273	0.062378	2.505245	0.0128
AR(4)	0.124541	0.063273	1.968302	0.0500
SAR(12)	-0.469556	0.056660	-8.287199	0.0000
SIGMASQ	0.004992	0.000363	13.73789	0.0000

R-squared	0.697309	Mean dependent var	-0.013703
Adjusted R-squared	0.684653	S.D. dependent var	0.128631
S.E. of regression	0.072234	Akaike info criterion	-2.365023
Sum squared resid	1.497488	Schwarz criterion	-2.204526
Log likelihood	367.7534	Hannan-Quinn criter.	-2.300792
F-statistic	55.09688	Durbin-Watson stat	2.035002
Prob(F-statistic)	0.000000		

Inverted AR Roots	.91+.24i	.91-.24i	0.71	.66+.66i
	.66-.66i	.24-.91i	.24+.91i	.03+.53i
	.03-.53i	-.24-.91i	-.24+.91i	-0.63
	-.66-.66i	-.66-.66i	-.91+.24i	-.91-.24i

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
VOLUME FORECASTING MODELS

SENDOUT

Dependent Variable: DLOG(GWHSO,0,4)
Method: ARMA Maximum Likelihood (OPG - BHHH)
Sample: 1993Q4 2018Q3
Included observations: 100
Convergence achieved after 26 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.018157	0.003361	-5.402410	0.0000
DLOG(PRICE(-3),0,4)	-0.029458	0.015694	-1.877081	0.0638
DLOG(EMP_N,0,4)	0.273130	0.110318	2.475846	0.0152
DLOG(NCINDEX,0,4)	2.140073	0.236509	9.048576	0.0000
D(CDD,0,4)	0.000274	1.36E-05	20.17943	0.0000
D(HDD,0,4)	5.27E-05	5.92E-06	8.903098	0.0000
D(LEAPY,0,4)	0.006575	0.003428	1.917853	0.0583
D(D201204,0,4)	-0.035801	0.011801	-3.033707	0.0032
MA(1)	0.566837	0.093363	6.071310	0.0000
SMA(4)	-0.369422	0.107594	-3.433491	0.0009
SIGMASQ	0.000116	1.73E-05	6.688480	0.0000

R-squared	0.897785	Mean dependent var	0.009039
Adjusted R-squared	0.886301	S.D. dependent var	0.033848
S.E. of regression	0.011413	Akaike info criterion	-5.994105
Sum squared resid	0.011593	Schwarz criterion	-5.707537
Log likelihood	310.7053	Hannan-Quinn criter.	-5.878126
F-statistic	78.17176	Durbin-Watson stat	1.986471
Prob(F-statistic)	0.000000		

Inverted MA Roots	0.78	.00+.78i	-.00-.78i	-0.57
	-0.78			

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
ELECTRIC FORECASTING MODEL STATISTICS

Model Statistics For
Electric Sales Volume Forecasting Models

	Adj R-Sqr *	SER	Durbin-Watson
SC1	0.9893	2.1%	1.938
SC2	0.9751	1.5%	2.025
SC9	0.9935	1.0%	1.869

* When the models are in differenced form, their Adj R-Sqr's are lower than shown in the table, because differencing accounts for a portion of the R-Sqr values.

Notes: Adj R-Sqr represents R Square adjusted for degrees of freedom.
SER represents Standard Error of Regression.

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
CUSTOMERS FORECASTING MODELS

SC 1 (RESIDENTIAL AND RELIGIOUS)

Dependent Variable: DLOG(NC01,0,4)
Method: ARMA Maximum Likelihood (OPG - BHHH)
Sample: 1993Q4 2018Q3
Included observations: 100
Convergence achieved after 38 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.004410	0.000499	8.844388	0.0000
DLOG(PNEMP_N,0,4)	0.063503	0.014716	4.315218	0.0000
AR(1)	0.961617	0.035012	27.46500	0.0000
SAR(4)	-0.540416	0.088957	-6.075009	0.0000
MA(1)	0.220937	0.105371	2.096746	0.0387
SMA(8)	-0.794957	0.097430	-8.159238	0.0000
SIGMASQ	5.11E-07	6.45E-08	7.912206	0.0000

R-squared	0.906392	Mean dependent var	0.005380
Adjusted R-squared	0.900353	S.D. dependent var	0.002347
S.E. of regression	0.000741	Akaike info criterion	-11.43197
Sum squared resid	5.11E-05	Schwarz criterion	-11.24961
Log likelihood	578.5987	Hannan-Quinn criter.	-11.35817
F-statistic	150.0847	Durbin-Watson stat	1.849902
Prob(F-statistic)	0.000000		

Inverted AR Roots	0.96	.61+.61i	.61+.61i	-.61-.61i
	-.61-.61i			
Inverted MA Roots	0.97	.69-.69i	.69-.69i	.00-.97i
	-.00+.97i	-0.22	-.69+.69i	-.69-.69i
	-0.97			

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
CUSTOMERS FORECASTING MODELS

SC 2 (GENERAL - SMALL)

Dependent Variable: DLOG(NC02,0,4)
Method: ARMA Maximum Likelihood (OPG - BHHH)
Sample: 1993Q4 2018Q3
Included observations: 100
Convergence achieved after 36 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.011488	0.011028	1.041719	0.3002
AR(1)	0.972727	0.030394	32.00360	0.0000
SAR(4)	-0.486707	0.097027	-5.016180	0.0000
MA(1)	0.594578	0.076005	7.822899	0.0000
SIGMASQ	1.16E-05	1.29E-06	8.985893	0.0000

R-squared	0.951180	Mean dependent var	0.011353
Adjusted R-squared	0.949124	S.D. dependent var	0.015492
S.E. of regression	0.003494	Akaike info criterion	-8.379152
Sum squared resid	0.001160	Schwarz criterion	-8.248894
Log likelihood	423.9576	Hannan-Quinn criter.	-8.326434
F-statistic	462.7284	Durbin-Watson stat	1.957519
Prob(F-statistic)	0.000000		

Inverted AR Roots	0.97	.59+.59i	.59+.59i	-.59-.59i
	-.59-.59i			
Inverted MA Roots	-0.59			

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
CUSTOMERS FORECASTING MODELS

SC 8 (MULTIPLE DWELLINGS - REDISTRIBUTION)

Dependent Variable: DLOG(NC08,0,4)
Method: ARMA Maximum Likelihood (OPG - BHHH)
Sample: 1993Q4 2018Q3
Included observations: 100
Convergence achieved after 22 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(D2007Q4,0,4)	0.033144	0.001697	19.53112	0.0000
AR(1)	0.899644	0.044861	20.05388	0.0000
SAR(4)	-0.476776	0.087963	-5.420204	0.0000
SIGMASQ	4.88E-06	6.32E-07	7.720702	0.0000

R-squared	0.933617	Mean dependent var	0.001355
Adjusted R-squared	0.931542	S.D. dependent var	0.008614
S.E. of regression	0.002254	Akaike info criterion	-9.291715
Sum squared resid	0.000488	Schwarz criterion	-9.187508
Log likelihood	468.5858	Hannan-Quinn criter.	-9.249541
Durbin-Watson stat	1.758902		

Inverted AR Roots	0.9	.59+.59i	.59+.59i	-.59-.59i
	-.59-.59i			

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
CUSTOMERS FORECASTING MODELS

SC 9 (GENERAL - LARGE)

Dependent Variable: DLOG(NC09,0,4)
Method: ARMA Maximum Likelihood (OPG - BHHH)
Sample: 1993Q4 2018Q3
Included observations: 100
Convergence achieved after 19 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(PNEMP_N,0,4)	0.073750	0.044098	1.672438	0.0978
D(D1995Q2,0,4)	0.012370	0.001686	7.336102	0.0000
D(D1995Q4,0,4)	0.007156	0.000890	8.043488	0.0000
AR(1)	0.991609	0.010173	97.47843	0.0000
SAR(4)	-0.477241	0.096420	-4.949581	0.0000
MA(1)	0.264640	0.106384	2.487595	0.0146
SIGMASQ	3.47E-06	4.84E-07	7.169525	0.0000

R-squared	0.961074	Mean dependent var	0.014073
Adjusted R-squared	0.958562	S.D. dependent var	0.009491
S.E. of regression	0.001932	Akaike info criterion	-9.544069
Sum squared resid	0.000347	Schwarz criterion	-9.361708
Log likelihood	484.2035	Hannan-Quinn criter.	-9.470264
Durbin-Watson stat	2.002434		

Inverted AR Roots	0.99	.59+.59i	.59+.59i	-.59-.59i
	-.59-.59i			
Inverted MA Roots	-0.26			

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
CUSTOMERS FORECASTING MODELS

SC 12 (MULTIPLE DWELLING SPACE HEATING)

Dependent Variable: DLOG(NC12,0,12)
Method: ARMA Maximum Likelihood (OPG - BHHH)
Sample: 1997M10 2018M09
Included observations: 252
Convergence achieved after 28 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.004944	0.001318	-3.751352	0.0002
AR(1)	0.838205	0.033265	25.19759	0.0000
SAR(12)	-0.456363	0.039643	-11.51169	0.0000
SIGMASQ	2.30E-05	1.58E-06	14.54968	0.0000

R-squared	0.643235	Mean dependent var	-0.004720
Adjusted R-squared	0.638919	S.D. dependent var	0.008054
S.E. of regression	0.004839	Akaike info criterion	-7.792766
Sum squared resid	0.005808	Schwarz criterion	-7.736743
Log likelihood	985.8885	Hannan-Quinn criter.	-7.770223
F-statistic	149.0450	Durbin-Watson stat	2.099176
Prob(F-statistic)	0.000000		

Inverted AR Roots	.90+.24i	.90-.24i	0.84	.66-.66i
	.66+.66i	.24+.90i	.24-.90i	-.24+.90i
	-.24-.90i	-.66+.66i	-.66+.66i	-.90-.24i
	-.90+.24i			

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
ECONOMIC ASSUMPTIONS

YEAR	QUARTER	NUMBER OF CUSTOMERS (1,000)							PRIVATE NON-MANUFACTURING EMPLOYMENT (1,000)	REAL DISPOSABLE PERSONAL INCOME (MILLION 2012 $)	REAL ELECTRIC PRICE (c/KWHR)			
		SC 1	SC 2	SC 5	SC 6	SC 8	SC 9	SC 12	Service Area Employment		SC 1	SC 2	SC 8	SC 9
2018	Q4	2,942.334	413.931	0.016	3.403	1.888	133.455	0.470	4,309.4	575,747	9.324	25.304	6.338	15.727
2019	Q1	2,946.017	418.906	0.016	3.403	1.887	133.268	0.469	4,232.3	573,967	9.522	24.248	6.596	15.463
2019	Q2	2,950.307	419.257	0.016	3.403	1.887	133.309	0.468	4,295.5	572,505	10.023	26.408	6.731	16.046
2019	Q3	2,952.163	420.060	0.016	3.403	1.887	133.825	0.468	4,262.7	571,332	9.511	26.870	7.115	16.302
2019	Q4	2,958.521	425.455	0.016	3.403	1.883	133.628	0.468	4,339.4	570,851	9.324	25.304	6.338	15.727
2020	Q1	2,962.101	430.246	0.016	3.403	1.883	133.449	0.467	4,250.0	571,095	9.522	24.248	6.596	15.463
2020	Q2	2,963.348	430.758	0.016	3.403	1.883	133.467	0.466	4,301.7	571,041	10.023	26.408	6.731	16.046
2020	Q3	2,964.243	431.562	0.016	3.403	1.883	134.033	0.465	4,261.3	571,122	9.511	26.870	7.115	16.302
2020	Q4	2,970.261	436.622	0.016	3.403	1.881	133.858	0.466	4,334.9	571,881	9.324	25.304	6.338	15.727
2021	Q1	2,973.512	441.433	0.016	3.403	1.880	133.652	0.464	4,242.6	572,623	9.522	24.248	6.596	15.463
2021	Q2	2,976.020	441.623	0.016	3.403	1.881	133.659	0.463	4,291.2	573,369	10.023	26.408	6.731	16.046
2021	Q3	2,977.446	442.204	0.016	3.403	1.881	134.200	0.463	4,254.9	575,713	9.511	26.870	7.115	16.302
2021	Q4	2,984.129	447.380	0.016	3.403	1.879	134.035	0.464	4,340.0	579,397	9.324	25.304	6.338	15.727
2022	Q1	2,988.017	452.117	0.016	3.403	1.879	133.862	0.462	4,258.9	582,948	9.522	24.248	6.596	15.463
2022	Q2	2,990.285	452.241	0.016	3.403	1.880	133.895	0.461	4,319.0	586,381	10.023	26.408	6.731	16.046
2022	Q3	2,991.706	452.724	0.016	3.403	1.880	134.461	0.461	4,286.4	589,696	9.511	26.870	7.115	16.302
2022	Q4	2,998.174	457.800	0.016	3.403	1.878	134.291	0.461	4,368.0	592,742	9.324	25.304	6.338	15.727

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
NYPA VOLUME FORECASTING MODELS

Dependent Variable: DLOG(GWH91,0,12)
Method: ARMA Conditional Least Squares (Marquardt - EViews legacy)
Sample (adjusted): 1997M01 2018M09
Included observations: 261 after adjustments
Convergence achieved after 9 iterations
MA Backcast: 1996M01 1996M12

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.024011	0.000807	29.73728	0.0000
D(WHDD,0,12)	0.000170	3.25E-05	5.227430	0.0000
D(WCDD,0,12)	0.000479	8.14E-05	5.885528	0.0000
DLOG(TR18,0,12)	0.328800	0.064079	5.131162	0.0000
D2009	-0.030244	0.001506	-20.08520	0.0000
MA(12)	-0.920843	0.016399	-56.15408	0.0000

R-squared	0.557124	Mean dependent var	0.010995
Adjusted R-squared	0.548440	S.D. dependent var	0.058484
S.E. of regression	0.039300	Akaike info criterion	-3.612460
Sum squared resid	0.393846	Schwarz criterion	-3.530517
Log likelihood	477.4261	Hannan-Quinn criter.	-3.579522
F-statistic	64.15637	Durbin-Watson stat	2.195910
Prob(F-statistic)	0.000000		

Inverted MA Roots	0.99	.86-.50i	.86+.50i	.50-.86i
	.50+.86i	.00+.99i	-.00-.99i	-.50+.86i
	-.50-.86i	-.86+.50i	-.86-.50i	-0.99

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
NYPA VOLUME FORECASTING MODELS

Dependent Variable: DLOG(GWH62/TRAVG,0,12)
Method: ARMA Conditional Least Squares (Marquardt - EViews legacy)
Sample (adjusted): 1997M04 2018M09
Included observations: 258 after adjustments
Convergence achieved after 13 iterations
MA Backcast: 1996M04 1997M03

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.068505	0.004813	-14.23202	0.0000
DLOG(TNEMP(-1),0,12)	2.317515	0.350611	6.609940	0.0000
D201611	-0.231888	0.094062	-2.465264	0.0144
AR(1)	-0.150056	0.061322	-2.447002	0.0151
AR(2)	0.230803	0.060906	3.789467	0.0002
MA(12)	-0.958683	0.008795	-108.9992	0.0000

R-squared	0.556017	Mean dependent var	-0.013294
Adjusted R-squared	0.547208	S.D. dependent var	0.238536
S.E. of regression	0.160511	Akaike info criterion	-0.797933
Sum squared resid	6.492435	Schwarz criterion	-0.715306
Log likelihood	108.9334	Hannan-Quinn criter.	-0.764709
F-statistic	63.11794	Durbin-Watson stat	2.094864
Prob(F-statistic)	0.000000		

Inverted AR Roots	0.41	-0.56		
Inverted MA Roots	1.00	.86-.50i	.86+.50i	.50-.86i
	.50+.86i	.00-1.00i	-.00+1.00i	-.50+.86i
	-.50-.86i	-.86+.50i	-.86-.50i	-1.00

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
NYPA VOLUME FORECASTING MODELS

Dependent Variable: DLOG((GWHKIAC/TR02),0,12)
Method: ARMA Conditional Least Squares (Marquardt - EViews legacy)
Sample (adjusted): 2001M02 2018M09
Included observations: 212 after adjustments
Convergence achieved after 11 iterations
MA Backcast: 2001M01

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.020101	0.017354	-1.158317	0.2481
D(HDD(-1),0,12)	0.000147	2.98E-05	4.931458	0.0000
D(CDD(-1),0,12)	0.000221	6.79E-05	3.248893	0.0014
DLOG(TNEMP(-1),0,12)	0.765332	0.423730	1.806179	0.0724
D(D201803,0,12)	0.164884	0.042331	3.895075	0.0001
AR(1)	0.955998	0.028886	33.09556	0.0000
SAR(12)	-0.417289	0.067131	-6.216027	0.0000
MA(1)	-0.689398	0.066828	-10.31602	0.0000

R-squared	0.434273	Mean dependent var	-0.002469
Adjusted R-squared	0.414861	S.D. dependent var	0.058524
S.E. of regression	0.044767	Akaike info criterion	-3.337665
Sum squared resid	0.408841	Schwarz criterion	-3.211002
Log likelihood	361.7925	Hannan-Quinn criter.	-3.286471
F-statistic	22.37111	Durbin-Watson stat	2.118367
Prob(F-statistic)	0.000000		

Inverted AR Roots	0.96	.90-.24i	.90+.24i	.66+.66i
	.66-.66i	.24+.90i	.24-.90i	-.24-.90i
	-.24+.90i	-.66+.66i	-.66+.66i	-.90+.24i
	-.90-.24i			
Inverted MA Roots	0.69			

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
DELIVERY VOLUME ADJUSTMENTS

	Impact of DSM on Delivery Volume - GWh							
	Con Ed DSM Impact						Total Con Ed	Total NYPA
PERIOD	SC 1	SC 2	SC 5	SC 8	SC 9	SC 12	Impact	Impact
3 months ending December 2018	(4)	0	0	0	(14)	0	(18)	0
12 months ending December 2019	(53)	(7)	0	0	(244)	0	(304)	(17)
12 months ending December 2020	(112)	(15)	0	0	(478)	0	(605)	(27)
12 months ending December 2021	(218)	(27)	0	(12)	(917)	0	(1,174)	(70)
12 months ending December 2022	(331)	(49)	0	(12)	(1,467)	0	(1,859)	(158)

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
DELIVERY VOLUME ADJUSTMENTS

Total Impact of Solar Generation on Delivery Volume - GWh

	Impact of Solar Generation on Con Ed Delivery Volume							Total Con Ed	Total NYPA	TOTAL
PERIOD	SC 1	SC 2	SC 5	SC 8	SC 9	SC 12	Standby	Impact	Impact	Impact
3 months ending December 2018	(7)	0	0	0	(2)	0	0	(9)	0	(9)
12 months ending December 2019	(38)	0	0	0	(14)	0	0	(52)	(4)	(56)
12 months ending December 2020	(70)	0	0	0	(26)	0	0	(96)	(8)	(104)
12 months ending December 2021	(109)	0	0	0	(37)	0	0	(146)	(11)	(157)
12 months ending December 2022	(155)	0	0	0	(49)	0	0	(204)	(14)	(218)

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
DELIVERY VOLUME ADJUSTMENTS

Total Impact of Conservation Voltage Optimization on Delivery Volume - GWh

	Impact of Conservation Voltage Optimization on Con Ed Delivery Volume							Total Con Ed	Total NYPA	TOTAL
PERIOD	SC 1	SC 2	SC 5	SC 8	SC 9	SC 12	Standby	Impact	Impact	Impact
3 months ending December 2018	0	0	0	0	0	0	0	0	0	0
12 months ending December 2019	(12)	0	0	0	(15)	0	0	(27)	0	(27)
12 months ending December 2020	(12)	0	0	0	(15)	0	0	(27)	0	(27)
12 months ending December 2021	(30)	(6)	0	0	(63)	0	0	(99)	0	(99)
12 months ending December 2022	(30)	(6)	0	0	(63)	0	0	(99)	0	(99)

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
DELIVERY VOLUME ADJUSTMENTS

Total Impact of Steam Air-Conditioning Conversions on Delivery Volume - GWh

	Impact of Steam AC on Con Ed Delivery Volume							Total Con Ed	Total NYPA	TOTAL
PERIOD	SC 1	SC 2	SC 5	SC 8	SC 9	SC 12	Standby	Impact	Impact	Impact
3 months ending December 2018	0	0	0	0	0	0	0	0	0	0
12 months ending December 2019	0	0	0	3	8	0	0	11	0	11
12 months ending December 2020	0	0	0	3	12	0	0	15	0	15
12 months ending December 2021	0	0	0	5	17	0	0	22	0	22
12 months ending December 2022	0	0	0	4	21	0	0	25	0	25

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
DELIVERY VOLUME ADJUSTMENTS

Total Impact of Electric Vehicles on Delivery Volume - GWh

	Impact of Electric Vehicles on Con Ed Delivery Volume							Total Con Ed	Total NYPA	TOTAL
PERIOD	SC 1	SC 2	SC 5	SC 8	SC 9	SC 12	Standby	Impact	Impact	Impact
3 months ending December 2018	3	0	0	0	0	0	0	3	0	3
12 months ending December 2019	18	0	0	0	0	0	0	18	0	18
12 months ending December 2020	41	0	0	0	0	0	0	41	0	41
12 months ending December 2021	75	0	0	0	0	0	0	75	0	75
12 months ending December 2022	128	0	0	0	0	0	0	128	0	128

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
DELIVERY VOLUME ADJUSTMENTS

Total Impact of Westchester Electrification on Delivery Volume - GWh

	Impact of Westchester Electrification on Con Ed Delivery Volume							Total Con Ed	Total NYPA	TOTAL
PERIOD	SC 1	SC 2	SC 5	SC 8	SC 9	SC 12	Standby	Impact	Impact	Impact
3 months ending December 2018	0	0	0	0	0	0	0	0	0	0
12 months ending December 2019	1	0	0	0	14	0	0	15	0	15
12 months ending December 2020	2	0	0	0	28	0	0	30	0	30
12 months ending December 2021	9	0	0	0	20	0	0	29	0	29
12 months ending December 2022	9	0	0	0	20	0	0	29	0	29

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
DELIVERY VOLUME ADJUSTMENTS

Total Impact of Indian Point Shutdown on Delivery Volume - GWh

	Impact of Indian Point Shutdown on Con Ed Delivery Volume							Total Con Ed	Total NYPA	TOTAL
PERIOD	SC 1	SC 2	SC 5	SC 8	SC 9	SC 12	Standby	Impact	Impact	Impact
3 months ending December 2018	0	0	0	0	0	0	0	0	0	0
12 months ending December 2019	0	0	0	0	0	0	0	0	0	0
12 months ending December 2020	0	0	0	0	0	0	0	0	0	0
12 months ending December 2021	0	0	0	0	72	0	0	72	0	72
12 months ending December 2022	0	0	0	0	108	0	0	108	0	108

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
DELIVERY VOLUME ADJUSTMENTS

Total Impact of Hudson Yards on Delivery Volume - GWh

	Impact of Hudson Yards on Con Ed Delivery Volume							Total Con Ed	Impact on NYPA		Total NYPA	TOTAL
PERIOD	SC 1	SC 2	SC 5	SC 8	SC 9	SC 12	Standby	**Impact**	NYPA	NYPA Standby	**Impact**	**Impact**
3 months ending December 2018	0	0	0	0	13	0	0	13	1	0	1	14
12 months ending December 2019	0	0	0	9	29	0	0	38	8	0	8	46
12 months ending December 2020	0	0	0	14	15	0	0	29	11	0	11	40
12 months ending December 2021	0	0	0	19	31	0	0	50	16	0	16	66
12 months ending December 2022	0	0	0	23	42	0	0	65	16	0	16	81

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
DELIVERY VOLUME ADJUSTMENTS

Total Impact of Standby Service on Delivery Volume - GWh

	Impact of Standby Service on Con Ed Delivery Volume							Total Con Ed	Total NYPA	TOTAL
PERIOD	SC 1	SC 2	SC 5	SC 8	SC 9	SC 12	Standby	**Impact**	**Impact**	**Impact**
3 months ending December 2018	0	0	0	0	(78)	0	0	(78)	0	(78)
12 months ending December 2019	0	0	0	0	(321)	0	0	(321)	0	(321)
12 months ending December 2020	0	0	0	0	(321)	0	0	(321)	(60)	(381)
12 months ending December 2021	0	0	0	0	(321)	0	0	(321)	(60)	(381)
12 months ending December 2022	0	0	0	0	(321)	0	0	(321)	(60)	(381)

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
ELECTRIC SENDOUT, SALES VOLUMES AND REVENUES FROM SALES VOLUMES
FORECASTED 3 MONTHS ENDING DECEMBER 31, 2018 AND YEARS ENDING DECEMBER 31, 2019, DECEMBER 31, 2020, DECEMBER 31, 2021, AND DECEMBER 31, 2022

		FORECASTED				
		3 Months Ending 12/31/2018 (1)	Year Ending 12/31/2019 (2)	Year Ending 12/31/2020 (3)	Year Ending 12/31/2021 (4)	Year Ending 12/31/2022 (5)
	SENDOUT - MILLION KILOWATTHOURS					
1	CON EDISON CUSTOMERS	11,153	48,055	47,411	45,935	44,853
2	RNY (Below the Allocation)	114	425	424	427	426
3	NYPA CUSTOMERS	2,462	10,362	10,185	10,058	9,884
4	TOTAL	13,729	58,842	58,020	56,420	55,163
	DELIVERY VOLUMES - MILLION KILOWATTHOURS					
5	CON EDISON CUSTOMERS	10,475	44,273	43,674	42,534	41,673
6	RNY (Below the Allocation) CUSTOMERS	206	726	726	726	726
7	NYPA CUSTOMERS	2,397	9,765	9,647	9,497	9,352
8	TOTAL	13,078	54,764	54,047	52,757	51,751
	REVENUES - $1,000					
9	CON EDISON CUSTOMERS					
10	NON COMPETITIVE DELIVERY REVENUES AT CURRENT RATES *	$1,059,210	$4,744,539	$4,710,390	$4,631,189	$4,581,393
11	COMPETITIVE DELIVERY REVENUES AT CURRENT RATES	27,584	114,975	114,067	112,483	111,706
12	MSC, MAC, AND DLM REVENUES	684,522	2,080,061	1,908,054	1,962,597	1,945,518
13	REACTIVE POWER REVENUES	1,346	5,346	5,346	5,346	5,346
14	SBC AND RPS REVENUES	76,159	308,061	323,875	355,298	378,879
15	SUB-TOTAL	1,848,821	7,252,982	7,061,732	7,066,913	7,022,842
16	RNY (Below the Allocation) DELIVERY REVENUE AT CURRENT RATES	10,740	37,412	37,460	37,460	37,460
17	NYPA DELIVERY REVENUE AT CURRENT RATES	138,989	623,894	629,306	630,777	633,434
18	REACTIVE POWER REVENUES	559	2,360	2,360	2,360	2,360
19	DLM REVENUES	0	8,438	8,082	10,150	8,511
20	REVENUE TAXES	66,112	242,970	230,853	230,205	230,379
21	SUB-TOTAL	$216,400	$915,074	$908,061	$910,952	$912,144
22	CON EDISON LOW INCOME DISCOUNT (INCLUDING REVENUE TAX)	($14,150)	($56,075)	($56,075)	($56,075)	($56,075)
23	TOTAL	$2,051,071	$8,111,981	$7,913,718	$7,921,790	$7,878,911
	PROPOSED RATE INCREASE - ANNUALIZED					
24	CON EDISON CUSTOMERS			$415,452		
25	RNY (Below the Allocation) CUSTOMERS			$3,191		
26	NYPA CUSTOMERS			53,579		
27	REVENUE TAXES			14,660		
28	CON EDISON LOW INCOME DISCOUNT			(1,918)		
29	TOTAL PROPOSED RATE INCREASE			$484,964		
30	GRAND TOTAL	$2,051,071	$8,111,981	$8,398,682	$7,921,790	$7,878,911

* Delivery Revenues at Current Rates do not reflect the Low Income Discount

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
ELECTRIC SALES VOLUMES AND REVENUES FROM SALES VOLUMES BY SERVICE CLASSIFICATION
FORECASTED 3 MONTHS ENDING DECEMBER 31, 2018

					REVENUES ($1,000)						
CATEGORY	SC NO.	DESCRIPTION	VOLUMES (MILLION KWHR) (1)	SUM OF MONTHLY BILLABLE DEMAND (MW) (2)	NON COMPETITIVE DELIVERY REVENUES AT CURRENT RATES (3)	COMPETITIVE SERVICE RATES BPP/MFC/METERING (4)	REACTIVE POWER REVENUE (5)	SBC/RPS (6)	MSC, MAC, AND DLM REVENUES (7)	REVENUE TAX (8)	TOTAL REVENUE AT CURRENT RATES (9)
	CON EDISON CUSTOMERS										
1	1	RESIDENTIAL & RELIGIOUS	3,045		$458,122	$17,379	$0	$22,139	$303,889	$35,468	$836,997
	2	GENERAL SMALL	547		92,231	2,758	0	3,977	50,187	3,767	152,920
	8	MULT. DWELL. REDISTRIBUTION	408	908	32,259	290	57	2,966	15,409	1,359	52,340
	9	GENERAL LARGE	6,293	16,723	465,267	7,045	1,220	45,753	310,992	21,439	851,716
	12	MULT. DWELL. SPACE HEATING	70	165	4,563	67	12	509	2,047	197	7,395
	13	BULK POWER - H. T. - HOUSING DEVEL.	—	—	—	—	—	—	—	—	—
2		TOTAL COMMERCIAL & INDUSTRIAL	7,318	17,796	594,320	10,160	1,289	53,205	378,635	26,762	1,064,371
	5	RAILROADS	30	57	764	3	3	218	658	49	1,695
	6	STREET LIGHTING	2		474	18	0	15	142	15	664
3		TOTAL PUBLIC AUTHORITY	32	57	1,238	21	3	233	800	64	2,359
4		STANDBY SERVICE *	80	672	5,530	24	54	582	1,198	219	7,607
5	TOTAL CON EDISON CUSTOMERS		10,475	18,525	1,059,210	27,584	1,346	76,159	684,522	62,513	1,911,334
6	RECHARGE NEW YORK (Below Allocation)		206	394	10,740					393	11,133
7	NYPA CUSTOMERS		2,397	5,558	138,989		559			3,206	142,754
8	SUBTOTAL SYSTEM		13,078	24,477	$1,208,939	$27,584	$1,905	$76,159	$684,522	$66,112	$2,065,221
9		CON EDISON LOW INCOME DISCOUNT			(13,803)					(347)	($14,150)
10	TOTAL SYSTEM		13,078	24,477	$1,195,136	$27,584	$1,905	$76,159	$684,522	$65,765	$2,051,071

* Demand is Contracted Demand

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
ELECTRIC SALES VOLUMES AND REVENUES FROM SALES VOLUMES BY SERVICE CLASSIFICATION
FORECASTED 12 MONTHS ENDING DECEMBER 31, 2019

					REVENUES ($1,000)						
CATEGORY	SC NO.	DESCRIPTION	VOLUMES (MILLION KWHR) (1)	SUM OF MONTHLY BILLABLE DEMAND (MW) (2)	NON COMPETITIVE DELIVERY REVENUES AT CURRENT RATES (3)	COMPETITIVE SERVICE RATES BPP/MFC/METERING (4)	REACTIVE POWER REVENUE (5)	SBC/RPS (6)	MSC, MAC, AND DLM REVENUES (7)	REVENUE TAX (8)	TOTAL REVENUE AT CURRENT RATES (9)
	CON EDISON CUSTOMERS										
1	1	RESIDENTIAL & RELIGIOUS	13,409		$2,067,932	$73,161	$0	$91,797	942,417	$137,193	$3,312,500
	2	GENERAL SMALL	2,407		417,274	11,679	0	16,478	159,791	14,129	619,351
	8	MULT. DWELL. REDISTRIBUTION	1,773	3,933	152,299	1,278	221	12,138	52,735	4,933	223,604
	9	GENERAL LARGE	25,854	67,370	2,048,108	28,358	4,843	181,966	908,150	69,481	3,240,906
	12	MULT. DWELL. SPACE HEATING	325	734	22,979	325	36	2,225	10,838	824	37,227
	13	BULK POWER - H. T. - HOUSING DEVEL.	–	–	–	–	–	–	–	–	–
2		TOTAL COMMERCIAL & INDUSTRIAL	30,359	72,037	2,640,660	41,640	5,100	212,807	1,131,514	89,367	4,121,088
	5	RAILROADS	119	244	3,544	11	38	815	2,289	138	6,835
	6	STREET LIGHTING	7		1,822	69	0	48	416	51	2,406
3		TOTAL PUBLIC AUTHORITY	126	244	5,366	80	38	863	2,705	189	9,241
4		STANDBY SERVICE *	379	3,078	30,581	94	208	2,595	3,425	893	37,796
5	TOTAL CON EDISON CUSTOMERS		44,273	75,359	4,744,539	114,975	5,346	308,061	2,080,061	227,642	7,480,624
6	RECHARGE NEW YORK (Below Allocation)		726	1,390	37,412					1,002	38,414
7	NYPA CUSTOMERS		9,765	23,148	623,894		2,360		8,438	14,326	649,018
8	SUBTOTAL SYSTEM		54,764	99,897	$5,405,845	$114,975	$7,706	$308,061	$2,088,499	$242,970	$8,168,056
9		CON EDISON LOW INCOME DISCOUNT			(54,700)					(1,375)	($56,075)
10	TOTAL SYSTEM		54,764	99,897	$5,351,145	$114,975	$7,706	$308,061	$2,088,499	$241,595	$8,111,981

* Demand is Contracted Demand

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
ELECTRIC SALES VOLUMES AND REVENUES FROM SALES VOLUMES BY SERVICE CLASSIFICATION
FORECASTED 12 MONTHS ENDING DECEMBER 31, 2020

CATEGORY	SC NO.	DESCRIPTION	VOLUMES (MILLION KWHR)	SUM OF MONTHLY BILLABLE DEMAND (MW)	NON COMPETITIVE DELIVERY REVENUES AT CURRENT RATES	COMPETITIVE SERVICE RATES BPP/MFC/METERING	REACTIVE POWER REVENUE	SBC/RPS	MSC, MAC, AND DLM REVENUES	REVENUE TAX	TOTAL REVENUE AT CURRENT RATES	PROPOSED CHANGE IN NON-COMPETITIVE RATES	PROPOSED CHANGE IN COMPETITIVE SERVICE RATES BPP/MFC/METERING	PROPOSED CHANGE IN REACTIVE POWER REVENUE	PROPOSED CHANGE IN MAC REVENUES	REVENUE TAX FROM INCREASE	TOTAL REVENUE AT PROPOSED RATES
					REVENUES ($1,000)												
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
		CON EDISON CUSTOMERS															
1	1	RESIDENTIAL & RELIGIOUS	13,222		$2,050,218	$72,492	$0	$96,448	902,555	$127,688	$3,249,401	$182,590	($2,204)	$0	$2,824	$5,711	$3,438,322
	2	GENERAL SMALL	2,441		425,247	11,949	0	17,806	156,823	14,300	626,125	38,632	(1,525)	0	586	1,175	664,993
	8	MULT. DWELL. REDISTRIBUTION	1,750	3,862	149,987	1,244	221	12,765	44,173	4,718	213,108	12,318	(306)	19	207	381	225,727
s	9	GENERAL LARGE	25,380	66,010	2,020,861	27,878	4,843	190,430	790,773	66,705	3,101,490	177,164	(3,385)	418	2,783	5,517	3,283,987
	12	MULT. DWELL. SPACE HEATING	324	731	22,941	323	36	2,363	9,292	795	35,750	2,101	(62)	3	32	65	37,890
	13	BULK POWER - H. T. - HOUSING DEVEL.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2		TOTAL COMMERCIAL & INDUSTRIAL	29,895	70,603	2,619,036	41,394	5,100	223,364	1,001,061	86,518	3,976,473	230,215	(5,278)	440	3,608	7,138	4,212,596
	5	RAILROADS	119	243	3,531	11	38	868	1,749	128	6,325	335	(2)	3	5	11	6,677
	6	STREET LIGHTING	7		1,810	69	0	51	389	50	2,369	299	(21)	0	2	9	2,658
3		TOTAL PUBLIC AUTHORITY	126	243	5,341	80	38	919	2,138	178	8,694	634	(23)	3	7	20	9,335
4		STANDBY SERVICE *	431	3,627	35,795	101	208	3,144	2,300	1,007	42,555	3,729	(32)	16	49	117	46,434
5		TOTAL CON EDISON CUSTOMERS	43,674	74,473	4,710,390	114,067	5,346	323,875	1,908,054	215,391	7,277,123	417,168	(7,537)	459	6,488	12,986	7,706,687
6		RECHARGE NEW YORK (Below Allocation) CUSTOMERS	726	1,390	37,460					1,010	38,470	3,191				99	41,760
7		NYPA CUSTOMERS	9,647	23,277	629,306		2,360		8,082	14,452	654,200	53,375		204		1,670	709,449
8		SUBTOTAL SYSTEM	54,047	99,140	$5,377,156	$114,067	$7,706	$323,875	$1,916,136	$230,853	$7,969,793	$473,734	($7,537)	$663	$6,488	$14,755	$8,457,896
9		CON EDISON LOW INCOME DISCOUNT			(54,700)					(1,375)	(56,075)	(1,918)				(60)	(58,053)
10		CON EDISON PURCHASE OF RECEIVABLES											(1,126)			(35)	(1,161)
11		TOTAL SYSTEM	54,047	99,140	$5,322,456	$114,067	$7,706	$323,875	$1,916,136	$229,478	$7,913,718	$471,816	($8,663)	$663	$6,488	$14,660	$8,398,682

* Demand is Contracted Demand

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
ELECTRIC SALES VOLUMES AND REVENUES FROM SALES VOLUMES BY SERVICE CLASSIFICATION
FORECASTED 12 MONTHS ENDING DECEMBER 31, 2021

					REVENUES ($1,000)						
CATEGORY	SC NO.	DESCRIPTION	VOLUMES (MILLION KWHR)	SUM OF MONTHLY BILLABLE DEMAND (MW)	NON COMPETITIVE DELIVERY REVENUES AT CURRENT RATES	COMPETITIVE SERVICE RATES BPP/MFC/METERING	REACTIVE POWER REVENUE	SBC/RPS	MSC, MAC, AND DLM REVENUES	REVENUE TAX	TOTAL REVENUE AT CURRENT RATES
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	CON EDISON CUSTOMERS										
1	1	RESIDENTIAL & RELIGIOUS	12,936		$2,018,345	$71,539	$0	$106,244	975,687	$127,652	$3,299,467
	2	GENERAL SMALL	2,447		428,994	12,119	0	20,097	171,669	14,793	647,672
	8	MULT. DWELL. REDISTRIBUTION	1,710	3,808	147,640	1,186	221	14,044	40,756	4,639	208,486
	9	GENERAL LARGE	24,563	64,224	1,972,120	27,141	4,843	207,701	762,942	65,665	3,040,412
	12	MULT. DWELL. SPACE HEATING	317	715	22,388	315	36	2,604	8,192	767	34,302
	13	BULK POWER - H. T. - HOUSING DEVEL.	–	–	–	–	–	–	–	–	–
2		TOTAL COMMERCIAL & INDUSTRIAL	29,037	68,747	2,571,142	40,761	5,100	244,446	983,559	85,864	3,930,872
	5	RAILROADS	119	245	3,539	11	38	977	1,381	125	6,071
	6	STREET LIGHTING	7		1,806	69	0	57	406	51	2,389
3		TOTAL PUBLIC AUTHORITY	126	245	5,345	80	38	1,035	1,787	176	8,461
4		STANDBY SERVICE *	435	3,708	36,357	103	208	3,573	1,564	1,013	42,818
5	TOTAL CON EDISON CUSTOMERS		42,534	72,700	4,631,189	112,483	5,346	355,298	1,962,597	214,705	7,281,618
6	RECHARGE NEW YORK (Below Allocation)		726	1,390	37,460					1,015	38,475
7	NYPA CUSTOMERS		9,497	23,481	630,777		2,360		10,150	14,485	657,772
8	SUBTOTAL SYSTEM		52,757	97,571	$5,299,426	$112,483	$7,706	$355,298	$1,972,747	$230,205	$7,977,865
9		CON EDISON LOW INCOME DISCOUNT			(54,700)					(1,375)	($56,075)
10	TOTAL SYSTEM		52,757	97,571	$5,244,726	$112,483	$7,706	$355,298	$1,972,747	$228,830	$7,921,790

* Demand is Contracted Demand

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
ELECTRIC SALES VOLUMES AND REVENUES FROM SALES VOLUMES BY SERVICE CLASSIFICATION
FORECASTED 12 MONTHS ENDING DECEMBER 31, 2022

CATEGORY	SC NO.	DESCRIPTION	VOLUMES (MILLION KWHR) (1)	SUM OF MONTHLY BILLABLE DEMAND (MW) (2)	REVENUES ($1,000): NON COMPETITIVE DELIVERY REVENUES AT CURRENT RATES (3)	COMPETITIVE SERVICE RATES BPP/MFC/METERING (4)	REACTIVE POWER REVENUE (5)	SBC/RPS (6)	MSC, MAC, AND DLM REVENUES (7)	REVENUES TAX (8)	TOTAL REVENUE AT CURRENT RATES (9)
	CON EDISON CUSTOMERS										
1	1	RESIDENTIAL & RELIGIOUS	12,769		$2,003,042	$71,010	$0	$114,104	$990,116	$127,857	$3,306,129
	2	GENERAL SMALL	2,463		434,519	12,315	0	22,009	179,784	15,241	663,868
	8	MULT. DWELL. REDISTRIBUTION	1,689	3,743	145,392	1,159	221	15,093	36,221	4,583	202,669
	9	GENERAL LARGE	23,878	62,650	1,934,614	26,726	4,843	219,862	728,686	65,166	2,979,897
	12	MULT. DWELL. SPACE HEATING	313	706	22,081	311	36	2,797	7,874	769	33,868
	13	BULK POWER - H. T. - HOUSING DEVEL.	–	–	–	–	–	–	–	–	–
2		TOTAL COMMERCIAL & INDUSTRIAL	28,343	67,099	2,536,606	40,511	5,100	259,761	952,565	85,759	3,880,302
	5	RAILROADS	119	244	3,545	11	38	1,063	1,169	125	5,951
	6	STREET LIGHTING	7		1,806	69	0	63	443	52	2,433
3		TOTAL PUBLIC AUTHORITY	126	244	5,351	80	38	1,126	1,612	177	8,384
4		STANDBY SERVICE *	435	3,708	36,394	105	208	3,887	1,225	1,013	42,832
5	TOTAL CON EDISON CUSTOMERS		41,673	71,051	4,581,393	111,706	5,346	378,879	1,945,518	214,806	7,237,648
6	RECHARGE NEW YORK (Below Allocation)		726	1,390	37,460					1,028	38,488
7	NYPA CUSTOMERS		9,352	23,615	633,434		2,360		8,511	14,545	658,850
8	SUBTOTAL SYSTEM		51,751	96,056	$5,252,287	$111,706	$7,706	$378,879	$1,954,029	$230,379	$7,934,986
9		CON EDISON LOW INCOME DISCOUNT			(54,700)					(1,375)	($56,075)
10	TOTAL SYSTEM		51,751	96,056	$5,197,587	$111,706	$7,706	$378,879	$1,954,029	$229,004	$7,878,911

* Demand is Contracted Demand

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
FUTURE AVERAGE DELIVERY AND SUPPLY PRICES BY SERVICE CLASSIFICATION

SC NO.	DESCRIPTION	Rate Year ending 12/31/2020			Rate Year ending 12/31/2021			Rate Year ending 12/31/2022		
		VOLUMES (MILLION KWHR)	DELIVERY REVENUES ($1,000)	SUPPLY REVENUES ($1,000)	VOLUMES (MILLION KWHR)	DELIVERY REVENUES ($1,000)	SUPPLY REVENUES ($1,000)	VOLUMES (MILLION KWHR)	DELIVERY REVENUES ($1,000)	SUPPLY REVENUES ($1,000)
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
CON EDISON CUSTOMERS										
1	RESIDENTIAL & RELIGIOUS	13,222	$2,735,761	$941,963	12,936	$2,661,228	$1,075,090	12,769	$2,611,823	$1,146,618
2	GENERAL SMALL	2,441	544,711	166,169	2,447	547,121	190,786	2,463	555,106	207,798
8	MULT. DWELL. REDISTRIBUTION	1,750	208,149	107,164	1,710	201,668	123,216	1,689	199,193	132,946
9	GENERAL LARGE	25,380	2,872,922	1,449,480	24,563	2,762,288	1,636,154	23,878	2,714,675	1,756,892
12	MULT. DWELL. SPACE HEATING	324	33,486	19,360	317	32,071	19,572	313	31,733	21,947
13	BULK POWER - H. T. - HOUSING DEVEL.	0	16	0	0	19	0	0	16	0
5	RAILROADS	119	6,677	0	119	6,411	0	119	6,431	0
6	STREET LIGHTING	7	2,371	296	7	2,354	325	7	2,376	373
	STANDBY SERVICE	431	46,613	(2,796)	435	46,765	(2,156)	435	47,197	(2,185)
TOTAL CON EDISON CUSTOMERS		43,674	6,450,705	2,681,636	42,534	6,259,926	3,042,987	41,673	6,168,550	3,264,389
RECHARGE NEW YORK CUSTOMERS		726	$41,658	$47,433	726	$41,564	$47,433	726	$41,813	$47,433
NYPA CUSTOMERS		9,647	$709,449	$630,287	9,497	$711,477	$620,487	9,352	$719,993	$611,014

SC NO.	DESCRIPTION	2020 AVERAGE PRICE (CENTS PER KWHR)		2021 AVERAGE PRICE (CENTS PER KWHR)		2022 AVERAGE PRICE (CENTS PER KWHR)	
		DELIVERY	SUPPLY	DELIVERY	SUPPLY	DELIVERY	SUPPLY
CON EDISON CUSTOMERS							
1	RESIDENTIAL & RELIGIOUS	20.69	7.12	20.57	8.31	20.45	8.98
2	GENERAL SMALL	22.32	6.81	22.36	7.80	22.54	8.44
8	MULT. DWELL. REDISTRIBUTION	11.89	6.12	11.79	7.21	11.79	7.87
9	GENERAL LARGE	11.32	5.71	11.25	6.66	11.37	7.36
12	MULT. DWELL. SPACE HEATING	10.34	5.98	10.12	6.17	10.14	7.01
13	BULK POWER - H. T. - HOUSING DEVEL.	N/A	N/A	N/A	N/A	N/A	N/A
5	RAILROADS	5.61	0.00	5.39	0.00	5.40	0.00
6	STREET LIGHTING	33.87	4.23	33.64	4.64	33.94	5.33
	STANDBY SERVICE	10.82	(0.65)	10.75	(0.50)	10.85	(0.50)
TOTAL CON EDISON CUSTOMERS		14.77	6.14	14.72	7.15	14.80	7.83
RECHARGE NEW YORK CUSTOMERS		5.74	6.53	5.73	6.53	5.76	6.53
NYPA CUSTOMERS		7.35	6.53	7.49	6.53	7.70	6.53

Notes: Delivery revenues consist of non-competitive T&D charges, competitive service charges (i.e., BPP, MFC, and Metering Charges, as applicable); SBC and RPS charges; and uncollectible bill expense associated with MSC and MAC.
Supply revenues assume projected MSC Charges.
Excludes Purchase of Receivables