

**MISSOURI PUBLIC SERVICE COMMISSION**

**STAFF REPORT**

**COST OF SERVICE**

**APPENDIX 2**

**Support for Staff  
Cost of  
Capital Recommendations**

**UNION ELECTRIC COMPANY,  
d/b/a Ameren Missouri**

**CASE NO. ER-2019-0335**

*Jefferson City, Missouri  
December 2019*

**AN ANALYSIS OF THE COST OF CAPITAL**

**FOR**

**UNION ELECTRIC COMPANY**

**CASE NO. ER-2019-0335**

**SCHEDULES**

**BY**

**Jeffrey Smith**

**Financial Analysis**

**MISSOURI PUBLIC SERVICE COMMISSION**

**December 2019**

**Union Electric Company**  
**Case No. ER-2019-0335**

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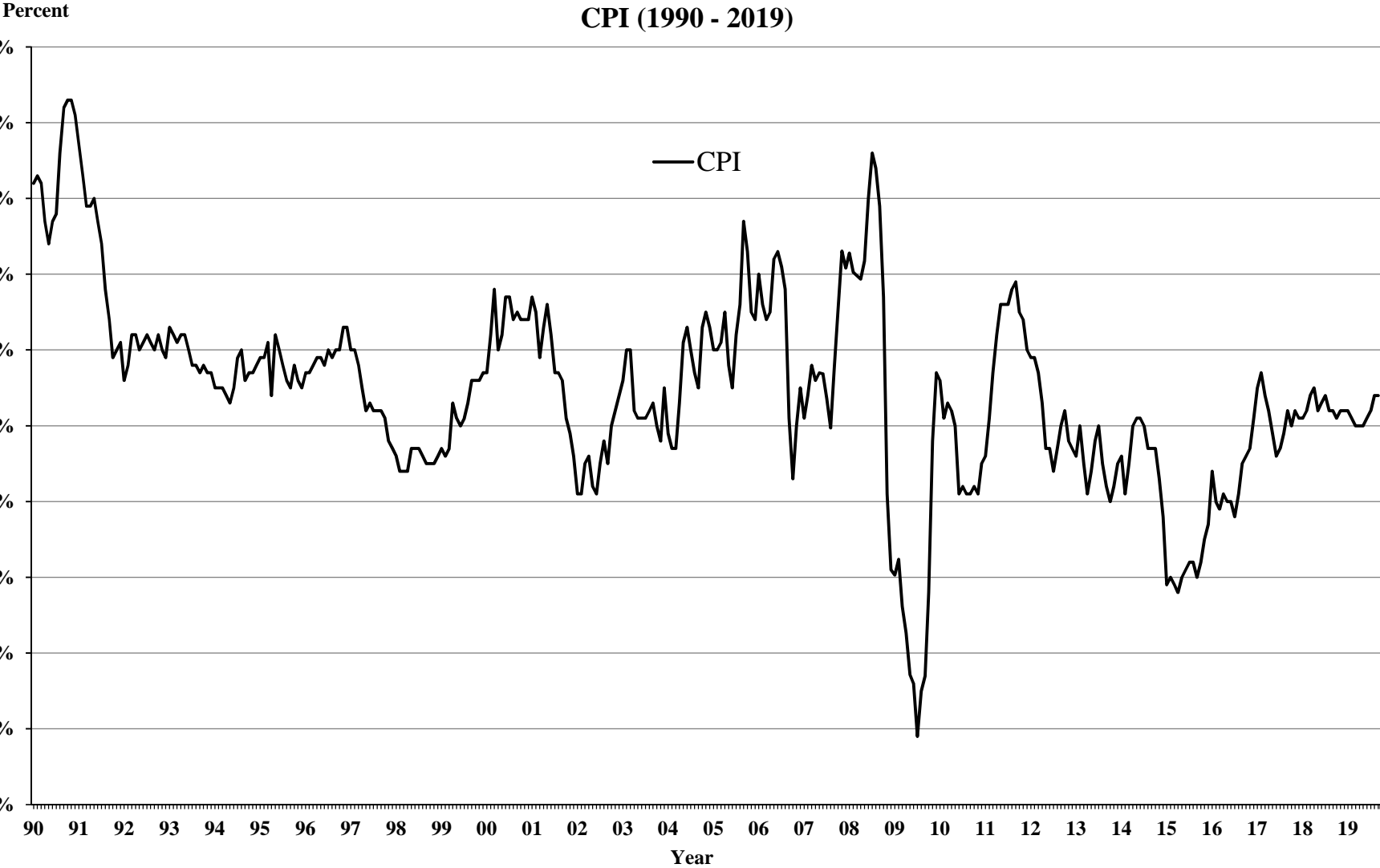
**Union Electric Company  
Case No. ER-2019-0335**

**Consumer Price Index (CPI) Rate of Inflation**

Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)
Jan 1990	5.20	Jan 1996	2.70	Jan 2002	1.10	Jan 2008	4.30	Jan 2015	-0.10
Feb	5.30	Feb	2.70	Feb	1.10	Feb	4.00	Feb	0.00
Mar	5.20	Mar	2.80	Mar	1.50	Mar	4.00	Mar	-0.10
Apr	4.70	Apr	2.90	Apr	1.60	Apr	3.90	Apr	-0.20
May	4.40	May	2.90	May	1.20	May	4.20	May	0.00
Jun	4.70	Jun	2.80	Jun	1.10	Jun	5.00	Jun	0.10
Jul	4.80	Jul	3.00	Jul	1.50	Jul	5.60	Jul	0.20
Aug	5.60	Aug	2.90	Aug	1.80	Aug	5.40	Aug	0.20
Sep	6.20	Sep	3.00	Sep	1.50	Sep	4.90	Sep	0.00
Oct	6.30	Oct	3.00	Oct	2.00	Oct	3.70	Oct	0.20
Nov	6.30	Nov	3.30	Nov	2.20	Nov	1.10	Nov	0.50
Dec	6.10	Dec	3.30	Dec	2.40	Dec	0.10	Dec	0.70
Jan 1991	5.70	Jan 1997	3.00	Jan 2003	2.60	Jan 2009	0.00	Jan 2016	1.40
Feb	5.30	Feb	3.00	Feb	3.00	Feb	0.20	Feb	1.00
Mar	4.90	Mar	2.80	Mar	3.00	Mar	-0.40	Mar	0.90
Apr	4.90	Apr	2.50	Apr	2.20	Apr	-0.70	Apr	1.10
May	5.00	May	2.20	May	2.10	May	-1.28	May	1.00
Jun	4.70	Jun	2.30	Jun	2.10	Jun	-1.40	Jun	1.00
Jul	4.40	Jul	2.20	Jul	2.10	Jul	-2.10	Jul	0.80
Aug	3.80	Aug	2.20	Aug	2.20	Aug	-1.50	Aug	1.10
Sep	3.40	Sep	2.20	Sep	2.30	Sep	-1.30	Sep	1.50
Oct	2.90	Oct	2.10	Oct	2.00	Oct	-0.20	Oct	1.60
Nov	3.00	Nov	1.80	Nov	1.80	Nov	1.80	Nov	1.70
Dec	3.10	Dec	1.70	Dec	1.90	Dec	2.70	Dec	2.10
Jan 1992	2.60	Jan 1998	1.60	Jan 2004	1.90	Jan 2010	2.60	Jan 2017	2.50
Feb	2.80	Feb	1.40	Feb	1.70	Feb	2.10	Feb	2.70
Mar	3.20	Mar	1.40	Mar	1.70	Mar	2.30	Mar	2.40
Apr	3.20	Apr	1.40	Apr	2.30	April	2.20	Apr	2.20
May	3.00	May	1.70	May	3.10	May	2.00	May	1.90
Jun	3.10	Jun	1.70	Jun	3.30	Jun	1.10	Jun	1.60
Jul	3.20	Jul	1.70	Jul	3.00	Jul	1.20	Jul	1.70
Aug	3.10	Aug	1.60	Aug	2.70	Aug	1.10	Aug	1.90
Sep	3.00	Sep	1.50	Sep	2.50	Sep	1.10	Sep	2.20
Oct	3.20	Oct	1.50	Oct	3.30	Oct	1.20	Oct	2.00
Nov	3.00	Nov	1.50	Nov	3.50	Nov	1.10	Nov	2.20
Dec	2.90	Dec	1.60	Dec	3.30	Dec	1.50	Dec	2.10
Jan 1993	3.30	Jan 1999	1.70	Jan 2005	3.00	Jan 2011	1.60	Jan 2018	2.10
Feb	3.20	Feb	1.60	Feb	3.00	Feb	2.10	Feb	2.20
Mar	3.10	Mar	1.70	Mar	3.10	Mar	2.70	Mar	2.40
Apr	3.20	Apr	2.30	Apr	3.50	Apr	3.20	Apr	2.50
May	3.20	May	2.10	May	2.80	May	3.60	May	2.20
Jun	3.00	Jun	2.00	Jun	2.50	Jun	3.60	Jun	2.30
Jul	2.80	Jul	2.10	Jul	3.20	Jul	3.60	Jul	2.40
Aug	2.80	Aug	2.30	Aug	3.60	Aug	3.80	Aug	2.20
Sep	2.70	Sep	2.60	Sep	4.70	Sep	3.90	Sep	2.20
Oct	2.80	Oct	2.60	Oct	4.30	Oct	3.50	Oct	2.10
Nov	2.70	Nov	2.60	Nov	3.50	Nov	3.40	Nov	2.20
Dec	2.70	Dec	2.70	Dec	3.40	Dec	3.00	Dec	2.20
Jan 1994	2.50	Jan 2000	2.70	Jan 2006	4.00	Jan 2012	2.90	Jan 2019	2.20
Feb	2.50	Feb	3.20	Feb	3.60	Feb	2.90	Feb	2.10
Mar	2.50	Mar	3.70	Mar	3.40	Mar	2.70	Mar	2.20
Apr	2.40	Apr	3.00	Apr	3.50	Apr	2.30	Apr	2.00
May	2.30	May	3.20	May	4.20	May	1.70	May	2.00
Jun	2.50	Jun	3.70	Jun	4.30	Jun	1.70	Jun	2.10
Jul	2.90	Jul	3.70	Jul	4.10	Jul	1.40	Jul	2.20
Aug	3.00	Aug	3.40	Aug	3.80	Aug	1.70	Aug	2.40
Sep	2.60	Sep	3.50	Sep	2.10	Sep	2.00	Sep	2.40
Oct	2.70	Oct	3.40	Oct	1.30	Oct	2.20		
Nov	2.70	Nov	3.40	Nov	2.00	Nov	1.80		
Dec	2.80	Dec	3.40	Dec	2.50	Dec	1.70		
Jan 1995	2.90	Jan 2001	3.70	Jan 2007	2.10	Jan 2013	1.60		
Feb	2.90	Feb	3.50	Feb	2.40	Feb	2.00		
Mar	3.10	Mar	2.90	Mar	2.80	Mar	1.50		
Apr	2.40	Apr	3.30	Apr	2.60	Apr	1.10		
May	3.20	May	3.60	May	2.70	May	1.40		
Jun	3.00	Jun	3.20	Jun	2.70	Jun	1.80		
Jul	2.80	Jul	2.70	Jul	2.40	Jul	2.00		
Aug	2.60	Aug	2.70	Aug	2.00	Aug	1.50		
Sep	2.50	Sep	2.60	Sep	2.80	Sept	1.20		
Oct	2.80	Oct	2.10	Oct	3.50	Oct	1.00		
Nov	2.60	Nov	1.90	Nov	4.30	Nov	1.20		
Dec	2.50	Dec	1.60	Dec	4.10	Dec	1.50		

Source: U.S. Dept of Labor, Bureau of Labor Statistics, Consumer Price Index - All Urban Consumers, Change for 12-Month Period, Bureau of Labor Statistics, [http://www.bls.gov/schedule/archives/cpi\\_nr.htm](http://www.bls.gov/schedule/archives/cpi_nr.htm)

Union Electric Company  
Case No. ER-2019-0335



**Union Electric Company**  
**Case No. ER-2019-0335**

**Average Yields of Different Treasury Securities and Average Spreads Between Yields**

Note: Shaded Date Ranges Correspond to U.S. Recessions

Underlined Spreads Correspond to Inverted Yield Curves

Date	Rate	2YR	5YR	10YR	30YR	2/5 Spread	2/10 Spread	2/30 Spread	5/10 Spread	5/30 Spread	10/30 Spread
Jan-90		8.09	8.12	8.21	8.26	0.03	0.12	0.17	0.09	0.14	0.05
Feb-90		8.37	8.42	8.47	8.50	0.05	0.10	0.13	0.05	0.08	0.03
Mar-90		8.63	8.60	8.59	8.56	<u>-0.03</u>	<u>-0.04</u>	<u>-0.06</u>	<u>-0.01</u>	<u>-0.04</u>	<u>-0.03</u>
Apr-90		8.72	8.77	8.79	8.76	0.04	0.06	0.03	0.02	<u>-0.01</u>	<u>-0.03</u>
May-90		8.64	8.74	8.76	8.73	0.09	0.12	0.09	0.02	0.00	<u>-0.03</u>
Jun-90		8.35	8.43	8.48	8.46	0.08	0.13	0.11	0.05	0.03	<u>-0.02</u>
Jul-90	8	8.16	8.33	8.47	8.50	0.17	0.31	0.34	0.14	0.17	0.03
Aug-90	8	8.06	8.44	8.75	8.86	0.38	0.69	0.80	0.32	0.43	0.11
Sep-90	8	8.08	8.51	8.89	9.03	0.43	0.81	0.95	0.38	0.52	0.14
Oct-90	7.75	7.88	8.33	8.72	8.86	0.45	0.84	0.98	0.39	0.53	0.14
Nov-90	7.5	7.60	8.02	8.39	8.54	0.42	0.79	0.94	0.37	0.52	0.15
Dec-90	7	7.31	7.73	8.08	8.24	0.41	0.76	0.92	0.35	0.51	0.16
Jan-91	6.75	7.13	7.70	8.09	8.27	0.57	0.97	1.14	0.39	0.57	0.18
Feb-91	6.25	6.87	7.47	7.85	8.03	0.61	0.99	1.17	0.38	0.56	0.18
Mar-91	6	7.10	7.77	8.11	8.29	0.67	1.01	1.19	0.34	0.52	0.18
Apr-91	6	6.95	7.70	8.04	8.21	0.75	1.09	1.26	0.34	0.51	0.17
May-91	5.75	6.78	7.70	8.07	8.27	0.92	1.28	1.48	0.37	0.57	0.20
Jun-91	5.75	6.96	7.94	8.28	8.47	0.98	1.33	1.52	0.35	0.53	0.19
Jul-91	5.75	6.92	7.91	8.27	8.45	0.99	1.36	1.53	0.36	0.54	0.18
Aug-91	5.5	6.43	7.43	7.90	8.14	0.99	1.47	1.71	0.48	0.72	0.24
Sep-91	5.25	6.18	7.14	7.65	7.95	0.95	1.47	1.77	0.51	0.81	0.30
Oct-91	5	5.91	6.87	7.53	7.93	0.96	1.62	2.02	0.66	1.06	0.40
Nov-91	4.75	5.56	6.62	7.42	7.92	1.06	1.86	2.36	0.80	1.30	0.50
Dec-91	4.5	5.03	6.19	7.09	7.70	1.16	2.06	2.68	0.90	1.52	0.61
Jan-92	4	4.96	6.24	7.03	7.58	1.28	2.07	2.62	0.79	1.34	0.55
Feb-92	4	5.21	6.58	7.34	7.85	1.37	2.13	2.64	0.76	1.28	0.52
Mar-92	4	5.69	6.95	7.54	7.97	1.26	1.86	2.28	0.60	1.02	0.43
Apr-92	3.75	5.34	6.78	7.48	7.96	1.44	2.14	2.62	0.70	1.18	0.48
May-92	3.75	5.23	6.69	7.39	7.89	1.47	2.17	2.67	0.70	1.20	0.50
Jun-92	3.75	5.05	6.48	7.26	7.84	1.43	2.21	2.79	0.78	1.36	0.58
Jul-92	3.25	4.36	5.84	6.84	7.60	1.48	2.49	3.24	1.01	1.76	0.75
Aug-92	3.25	4.19	5.60	6.59	7.39	1.40	2.39	3.20	0.99	1.79	0.80
Sep-92	3	3.89	5.38	6.42	7.34	1.49	2.52	3.45	1.04	1.96	0.93
Oct-92	3	4.08	5.60	6.59	7.53	1.52	2.51	3.45	0.99	1.93	0.94
Nov-92	3	4.58	6.04	6.87	7.61	1.46	2.29	3.03	0.84	1.57	0.73
Dec-92	3	4.67	6.08	6.77	7.44	1.40	2.10	2.76	0.69	1.36	0.67
Jan-93	3	4.39	5.83	6.60	7.34	1.44	2.21	2.95	0.77	1.51	0.74
Feb-93	3	4.10	5.43	6.26	7.09	1.33	2.16	2.99	0.83	1.66	0.83
Mar-93	3	3.95	5.19	5.98	6.82	1.25	2.03	2.87	0.78	1.63	0.85
Apr-93	3	3.84	5.13	5.97	6.85	1.30	2.13	3.02	0.84	1.72	0.88
May-93	3	3.98	5.20	6.04	6.92	1.22	2.06	2.94	0.84	1.72	0.88
Jun-93	3	4.16	5.22	5.96	6.81	1.05	1.80	2.64	0.75	1.59	0.84
Jul-93	3	4.07	5.09	5.81	6.63	1.02	1.73	2.55	0.71	1.53	0.82
Aug-93	3	4.00	5.03	5.68	6.32	1.02	1.68	2.32	0.65	1.30	0.65
Sep-93	3	3.85	4.73	5.36	6.00	0.89	1.51	2.15	0.63	1.26	0.64
Oct-93	3	3.87	4.71	5.33	5.94	0.83	1.46	2.06	0.63	1.23	0.61
Nov-93	3	4.16	5.06	5.72	6.21	0.91	1.57	2.05	0.66	1.15	0.49
Dec-93	3	4.21	5.15	5.77	6.25	0.93	1.56	2.04	0.63	1.11	0.48
Jan-94	3	4.14	5.09	5.75	6.29	0.95	1.61	2.15	0.66	1.20	0.54

**Union Electric Company**  
**Case No. ER-2019-0335**

**Average Yields of Different Treasury Securities and Average Spreads Between Yields**

Note: Shaded Date Ranges Correspond to U.S. Recessions

Underlined Spreads Correspond to Inverted Yield Curves

<b>Date</b>	<b>Rate</b>	<b>2YR</b>	<b>5YR</b>	<b>10YR</b>	<b>30YR</b>	<b>2/5 Spread</b>	<b>2/10 Spread</b>	<b>2/30 Spread</b>	<b>5/10 Spread</b>	<b>5/30 Spread</b>	<b>10/30 Spread</b>
Feb-94	3.25	4.47	5.40	5.97	6.49	0.92	1.50	2.02	0.58	1.10	0.52
Mar-94	3.5	5.00	5.94	6.48	6.91	0.95	1.49	1.91	0.54	0.97	0.42
Apr-94	3.75	5.55	6.52	6.97	7.27	0.97	1.42	1.72	0.45	0.74	0.30
May-94	4.25	5.97	6.78	7.18	7.41	0.81	1.22	1.44	0.40	0.63	0.23
Jun-94	4.25	5.93	6.70	7.10	7.40	0.76	1.17	1.46	0.41	0.70	0.29
Jul-94	4.25	6.13	6.91	7.30	7.58	0.78	1.17	1.45	0.39	0.67	0.28
Aug-94	4.75	6.18	6.88	7.24	7.49	0.70	1.06	1.31	0.36	0.61	0.25
Sep-94	4.75	6.39	7.08	7.46	7.71	0.69	1.06	1.32	0.37	0.63	0.26
Oct-94	4.75	6.73	7.40	7.74	7.94	0.67	1.02	1.21	0.34	0.53	0.19
Nov-94	5.5	7.15	7.72	7.96	8.08	0.57	0.81	0.93	0.24	0.36	0.13
Dec-94	5.5	7.59	7.78	7.81	7.87	0.19	0.22	0.28	0.04	0.10	0.06
Jan-95	5.5	7.51	7.76	7.78	7.85	0.25	0.27	0.34	0.02	0.09	0.07
Feb-95	6	7.11	7.37	7.47	7.61	0.25	0.36	0.50	0.10	0.25	0.14
Mar-95	6	6.78	7.05	7.20	7.45	0.27	0.43	0.67	0.16	0.40	0.24
Apr-95	6	6.57	6.86	7.06	7.36	0.29	0.49	0.79	0.20	0.50	0.30
May-95	6	6.17	6.41	6.63	6.95	0.24	0.46	0.78	0.22	0.54	0.32
Jun-95	6	5.72	5.93	6.17	6.57	0.21	0.45	0.86	0.24	0.64	0.41
Jul-95	5.75	5.78	6.01	6.28	6.72	0.23	0.50	0.94	0.27	0.71	0.44
Aug-95	5.75	5.98	6.24	6.49	6.86	0.26	0.51	0.88	0.24	0.62	0.37
Sep-95	5.75	5.81	6.00	6.20	6.55	0.20	0.39	0.74	0.20	0.55	0.35
Oct-95	5.75	5.70	5.86	6.04	6.37	0.17	0.35	0.68	0.18	0.51	0.33
Nov-95	5.75	5.48	5.69	5.93	6.26	0.22	0.45	0.78	0.24	0.57	0.33
Dec-95	5.75	5.32	5.51	5.71	6.06	0.19	0.39	0.74	0.20	0.55	0.35
Jan-96	5.5	5.11	5.36	5.65	6.05	0.25	0.54	0.94	0.29	0.69	0.40
Feb-96	5.25	5.03	5.38	5.81	6.24	0.35	0.78	1.22	0.43	0.86	0.44
Mar-96	5.25	5.66	5.97	6.27	6.60	0.31	0.61	0.94	0.30	0.64	0.34
Apr-96	5.5	5.96	6.30	6.51	6.79	0.34	0.55	0.84	0.21	0.49	0.28
May-96	5.5	6.10	6.48	6.74	6.93	0.39	0.64	0.83	0.25	0.44	0.19
Jun-96	5.5	6.30	6.69	6.91	7.06	0.39	0.62	0.76	0.22	0.37	0.15
Jul-96	5.5	6.27	6.64	6.87	7.03	0.37	0.60	0.76	0.23	0.40	0.17
Aug-96	5.5	6.03	6.39	6.64	6.84	0.36	0.61	0.81	0.25	0.45	0.21
Sep-96	5.5	6.23	6.60	6.83	7.03	0.36	0.60	0.79	0.23	0.43	0.19
Oct-96	5.5	5.91	6.27	6.53	6.81	0.36	0.62	0.90	0.26	0.54	0.28
Nov-96	5.5	5.70	5.97	6.20	6.48	0.27	0.50	0.78	0.23	0.51	0.28
Dec-96	5.5	5.78	6.07	6.30	6.55	0.29	0.52	0.77	0.23	0.48	0.25
Jan-97	5.5	6.01	6.33	6.58	6.83	0.33	0.57	0.82	0.25	0.49	0.25
Feb-97	5.5	5.90	6.20	6.42	6.69	0.30	0.52	0.79	0.22	0.49	0.27
Mar-97	5.5	6.22	6.54	6.69	6.93	0.32	0.47	0.71	0.16	0.40	0.24
Apr-97	5.5	6.45	6.76	6.89	7.09	0.31	0.44	0.64	0.13	0.33	0.21
May-97	5.5	6.28	6.57	6.71	6.94	0.29	0.43	0.66	0.14	0.37	0.22
Jun-97	5.5	6.09	6.38	6.49	6.77	0.28	0.40	0.68	0.12	0.40	0.28
Jul-97	5.5	5.89	6.12	6.22	6.51	0.23	0.33	0.62	0.10	0.39	0.29
Aug-97	5.5	5.94	6.16	6.30	6.58	0.22	0.36	0.64	0.14	0.42	0.28
Sep-97	5.5	5.88	6.11	6.21	6.50	0.22	0.33	0.61	0.10	0.39	0.29
Oct-97	5.5	5.77	5.93	6.03	6.33	0.16	0.26	0.55	0.10	0.40	0.30
Nov-97	5.5	5.71	5.80	5.88	6.11	0.09	0.16	0.40	0.07	0.31	0.23
Dec-97	5.5	5.72	5.77	5.81	5.99	0.06	0.09	0.28	0.04	0.22	0.18
Jan-98	5.5	5.36	5.42	5.54	5.81	0.06	0.19	0.45	0.13	0.40	0.27
Feb-98	5.5	5.42	5.49	5.57	5.89	0.07	0.16	0.47	0.08	0.40	0.32

**Union Electric Company  
Case No. ER-2019-0335**

**Average Yields of Different Treasury Securities and Average Spreads Between Yields**

Note: Shaded Date Ranges Correspond to U.S. Recessions

Underlined Spreads Correspond to Inverted Yield Curves

Date	Rate	2YR	5YR	10YR	30YR	2/5 Spread	2/10 Spread	2/30 Spread	5/10 Spread	5/30 Spread	10/30 Spread
Mar-98	5.5	5.56	5.61	5.65	5.95	0.05	0.09	0.39	0.04	0.34	0.30
Apr-98	5.5	5.56	5.61	5.64	5.92	0.05	0.07	0.36	0.03	0.31	0.29
May-98	5.5	5.59	5.63	5.65	5.93	0.03	0.06	0.33	0.02	0.30	0.27
Jun-98	5.5	5.52	5.52	5.50	5.70	0.00	<u>-0.02</u>	0.18	<u>-0.03</u>	0.18	0.21
Jul-98	5.5	5.46	5.46	5.46	5.68	0.00	0.00	0.22	0.00	0.22	0.22
Aug-98	5.5	5.27	5.27	5.34	5.54	0.01	0.07	0.27	0.07	0.27	0.20
Sep-98	5.25	4.67	4.62	4.81	5.20	<u>-0.04</u>	0.14	0.54	0.18	0.58	0.40
Oct-98	5	4.09	4.18	4.53	5.01	0.09	0.44	0.92	0.35	0.83	0.48
Nov-98	4.75	4.54	4.54	4.83	5.25	0.00	0.29	0.71	0.29	0.71	0.42
Dec-98	4.75	4.51	4.45	4.65	5.06	<u>-0.06</u>	0.14	0.55	0.19	0.61	0.41
Jan-99	4.75	4.62	4.60	4.72	5.16	<u>-0.01</u>	0.11	0.54	0.12	0.56	0.44
Feb-99	4.75	4.88	4.91	5.00	5.37	0.04	0.12	0.49	0.08	0.45	0.37
Mar-99	4.75	5.05	5.14	5.23	5.58	0.09	0.18	0.53	0.09	0.44	0.35
Apr-99	4.75	4.98	5.08	5.18	5.55	0.10	0.21	0.57	0.11	0.47	0.36
May-99	4.75	5.25	5.44	5.54	5.81	0.18	0.29	0.55	0.10	0.37	0.27
Jun-99	4.75	5.62	5.81	5.90	6.04	0.19	0.28	0.42	0.09	0.23	0.14
Jul-99	5	5.55	5.68	5.79	5.98	0.12	0.24	0.43	0.11	0.30	0.19
Aug-99	5	5.68	5.84	5.94	6.07	0.16	0.26	0.39	0.10	0.23	0.13
Sep-99	5.25	5.66	5.80	5.92	6.07	0.14	0.25	0.41	0.11	0.27	0.16
Oct-99	5.25	5.86	6.03	6.11	6.26	0.17	0.25	0.40	0.08	0.23	0.15
Nov-99	5.25	5.86	5.97	6.03	6.15	0.11	0.17	0.28	0.06	0.18	0.11
Dec-99	5.5	6.10	6.19	6.28	6.35	0.08	0.17	0.25	0.09	0.17	0.08
Jan-00	5.50	6.44	6.58	6.66	6.63	0.14	0.22	0.19	0.08	0.05	<u>-0.04</u>
Feb-00	5.75	6.61	6.68	6.52	6.23	0.07	<u>-0.09</u>	<u>-0.38</u>	<u>-0.16</u>	<u>-0.45</u>	<u>-0.29</u>
Mar-00	5.75	6.53	6.50	6.26	6.05	<u>-0.02</u>	<u>-0.27</u>	<u>-0.47</u>	<u>-0.25</u>	<u>-0.45</u>	<u>-0.20</u>
Apr-00	6	6.40	6.26	5.99	5.85	<u>-0.14</u>	<u>-0.41</u>	<u>-0.56</u>	<u>-0.27</u>	<u>-0.42</u>	<u>-0.14</u>
May-00	6	6.81	6.69	6.44	6.15	<u>-0.12</u>	<u>-0.37</u>	<u>-0.66</u>	<u>-0.25</u>	<u>-0.54</u>	<u>-0.29</u>
Jun-00	6.5	6.48	6.30	6.10	5.93	<u>-0.18</u>	<u>-0.38</u>	<u>-0.56</u>	<u>-0.20</u>	<u>-0.37</u>	<u>-0.17</u>
Jul-00	6.5	6.34	6.18	6.05	5.85	<u>-0.16</u>	<u>-0.29</u>	<u>-0.49</u>	<u>-0.13</u>	<u>-0.33</u>	<u>-0.20</u>
Aug-00	6.5	6.23	6.06	5.83	5.72	<u>-0.17</u>	<u>-0.40</u>	<u>-0.51</u>	<u>-0.23</u>	<u>-0.34</u>	<u>-0.11</u>
Sep-00	6.5	6.08	5.93	5.80	5.83	<u>-0.15</u>	<u>-0.28</u>	<u>-0.26</u>	<u>-0.14</u>	<u>-0.11</u>	0.03
Oct-00	6.5	5.91	5.78	5.74	5.80	<u>-0.13</u>	<u>-0.17</u>	<u>-0.11</u>	<u>-0.04</u>	0.02	0.06
Nov-00	6.5	5.88	5.70	5.72	5.78	<u>-0.18</u>	<u>-0.16</u>	<u>-0.10</u>	0.02	0.08	0.06
Dec-00	6.5	5.35	5.17	5.24	5.49	<u>-0.18</u>	<u>-0.11</u>	0.14	0.07	0.32	0.25
Jan-01	6	4.76	4.86	5.16	5.54	0.10	0.40	0.78	0.30	0.68	0.38
Feb-01	5.5	4.66	4.89	5.10	5.45	0.23	0.44	0.80	0.21	0.57	0.36
Mar-01	5.5	4.34	4.64	4.89	5.34	0.30	0.54	1.00	0.24	0.70	0.45
Apr-01	5	4.23	4.76	5.14	5.65	0.53	0.91	1.41	0.38	0.88	0.51
May-01	4.5	4.26	4.93	5.39	5.78	0.67	1.13	1.52	0.46	0.85	0.39
Jun-01	4	4.08	4.81	5.28	5.67	0.73	1.20	1.59	0.48	0.86	0.39
Jul-01	3.75	4.04	4.76	5.24	5.61	0.72	1.20	1.57	0.47	0.85	0.38
Aug-01	3.5	3.76	4.57	4.97	5.48	0.82	1.21	1.73	0.40	0.91	0.51
Sep-01	3	3.12	4.12	4.73	5.48	1.00	1.61	2.36	0.62	1.37	0.75
Oct-01	2.5	2.73	3.91	4.57	5.32	1.18	1.84	2.59	0.66	1.41	0.75
Nov-01	2	2.78	3.97	4.65	5.12	1.19	1.87	2.34	0.68	1.15	0.47
Dec-01	1.75	3.11	4.39	5.09	5.48	1.28	1.98	2.37	0.70	1.09	0.39
Jan-02	1.75	3.03	4.34	5.04	5.45	1.31	2.01	2.42	0.70	1.11	0.41
Feb-02	1.75	3.02	4.30	4.91	5.40	1.28	1.90	2.39	0.61	1.10	0.49
Mar-02	1.75	3.56	4.74	5.28	0	1.18	1.73		0.55		



**Union Electric Company**  
**Case No. ER-2019-0335**

**Average Yields of Different Treasury Securities and Average Spreads Between Yields**

Note: Shaded Date Ranges Correspond to U.S. Recessions

Underlined Spreads Correspond to Inverted Yield Curves

<b>Date</b>	<b>Rate</b>	<b>2YR</b>	<b>5YR</b>	<b>10YR</b>	<b>30YR</b>	<b>2/5 Spread</b>	<b>2/10 Spread</b>	<b>2/30 Spread</b>	<b>5/10 Spread</b>	<b>5/30 Spread</b>	<b>10/30 Spread</b>
Apr-02	1.75	3.42	4.65	5.21	0	1.22	1.79		0.56		
May-02	1.75	3.26	4.49	5.16	0	1.23	1.90		0.67		
Jun-02	1.75	2.99	4.19	4.93	0	1.19	1.93		0.74		
Jul-02	1.75	2.56	3.81	4.65	0	1.25	2.10		0.85		
Aug-02	1.75	2.13	3.29	4.26	0	1.16	2.12		0.96		
Sep-02	1.75	2.00	2.94	3.87	0	0.93	1.87		0.93		
Oct-02	1.75	1.91	2.95	3.94	0	1.03	2.03		1.00		
Nov-02	1.25	1.92	3.05	4.05	0	1.13	2.13		0.99		
Dec-02	1.25	1.84	3.03	4.03	0	1.20	2.20		1.00		
Jan-03	1.25	1.74	3.05	4.05	0	1.31	2.31		1.00		
Feb-03	1.25	1.63	2.90	3.90	0	1.27	2.27		1.00		
Mar-03	1.25	1.57	2.78	3.81	0	1.21	2.23		1.02		
Apr-03	1.25	1.62	2.93	3.96	0	1.31	2.34		1.03		
May-03	1.25	1.42	2.52	3.57	0	1.10	2.15		1.05		
Jun-03	1.25	1.23	2.27	3.33	0	1.04	2.11		1.07		
Jul-03	1	1.47	2.87	3.98	0	1.40	2.50		1.10		
Aug-03	1	1.86	3.37	4.45	0	1.51	2.58		1.08		
Sep-03	1	1.71	3.18	4.27	0	1.48	2.57		1.09		
Oct-03	1	1.75	3.19	4.29	0	1.44	2.54		1.10		
Nov-03	1	1.93	3.29	4.30	0	1.36	2.37		1.01		
Dec-03	1	1.91	3.27	4.27	0	1.36	2.36		1.00		
Jan-04	1	1.76	3.12	4.15	0	1.36	2.39		1.03		
Feb-04	1	1.74	3.07	4.08	0	1.33	2.34		1.02		
Mar-04	1	1.58	2.79	3.83	0	1.21	2.25		1.04		
Apr-04	1	2.07	3.39	4.35	0	1.32	2.28		0.96		
May-04	1	2.53	3.85	4.72	0	1.32	2.18		0.87		
Jun-04	1	2.76	3.93	4.73	0	1.17	1.97		0.80		
Jul-04	1.25	2.64	3.69	4.50	0	1.05	1.86		0.81		
Aug-04	1.25	2.51	3.47	4.28	0	0.97	1.77		0.81		
Sep-04	1.5	2.53	3.36	4.13	0	0.83	1.60		0.77		
Oct-04	1.75	2.58	3.35	4.10	0	0.76	1.51		0.75		
Nov-04	2	2.85	3.53	4.19	0	0.67	1.34		0.67		
Dec-04	2.25	3.01	3.60	4.23	0	0.59	1.22		0.63		
Jan-05	2.25	3.22	3.71	4.22	0	0.48	1.00		0.51		
Feb-05	2.5	3.38	3.77	4.17	0	0.38	0.78		0.40		
Mar-05	2.5	3.73	4.17	4.50	0	0.44	0.77		0.33		
Apr-05	2.75	3.65	4.00	4.34	0	0.34	0.69		0.34		
May-05	3	3.64	3.85	4.14	0	0.21	0.50		0.29		
Jun-05	3	3.64	3.77	4.00	0	0.13	0.36		0.23		
Jul-05	3.25	3.87	3.98	4.18	0	0.11	0.31		0.20		
Aug-05	3.5	4.04	4.12	4.26	0	0.08	0.22		0.14		
Sep-05	3.5	3.95	4.01	4.20	0	0.06	0.25		0.19		
Oct-05	3.75	4.27	4.33	4.46	0	0.06	0.19		0.14		
Nov-05	4	4.42	4.45	4.54	0	0.04	0.12		0.08		
Dec-05	4.25	4.40	4.39	4.47	0	<u>-0.01</u>	0.06		0.07		
Jan-06	4.25	4.40	4.35	4.42	0	<u>-0.05</u>	0.02		0.07		
Feb-06	4.5	4.67	4.57	4.57	4.54	<u>-0.10</u>	<u>-0.10</u>	<u>-0.13</u>	0.00	<u>-0.04</u>	<u>-0.03</u>
Mar-06	4.5	4.73	4.72	4.72	4.73	<u>-0.02</u>	<u>-0.01</u>	0.00	0.01	0.02	0.01
Apr-06	4.75	4.89	4.90	4.99	5.06	0.01	0.10	0.17	0.09	0.16	0.07

**Union Electric Company  
Case No. ER-2019-0335**

**Average Yields of Different Treasury Securities and Average Spreads Between Yields**

Note: Shaded Date Ranges Correspond to U.S. Recessions

Underlined Spreads Correspond to Inverted Yield Curves

Date	Rate	2YR	5YR	10YR	30YR	2/5 Spread	2/10 Spread	2/30 Spread	5/10 Spread	5/30 Spread	10/30 Spread
May-06	5	4.97	5.00	5.11	5.20	0.03	0.14	0.23	0.11	0.20	0.09
Jun-06	5	5.12	5.07	5.11	5.15	<u>-0.05</u>	<u>-0.02</u>	0.03	0.04	0.09	0.05
Jul-06	5.25	5.12	5.04	5.09	5.13	<u>-0.08</u>	<u>-0.03</u>	0.02	0.05	0.09	0.05
Aug-06	5.25	4.90	4.82	4.88	5.00	<u>-0.08</u>	<u>-0.03</u>	0.09	0.05	0.17	0.12
Sep-06	5.25	4.77	4.67	4.72	4.85	<u>-0.10</u>	<u>-0.05</u>	0.08	0.05	0.18	0.13
Oct-06	4.75	4.80	4.69	4.73	4.85	<u>-0.11</u>	<u>-0.07</u>	0.06	0.04	0.17	0.13
Nov-06	4.5	4.74	4.58	4.60	4.69	<u>-0.16</u>	<u>-0.15</u>	<u>-0.05</u>	0.01	0.10	0.09
Dec-06	4.25	4.67	4.53	4.56	4.68	<u>-0.14</u>	<u>-0.11</u>	0.01	0.03	0.15	0.12
Jan-07	4.25	4.88	4.75	4.76	4.85	<u>-0.12</u>	<u>-0.12</u>	<u>-0.02</u>	0.01	0.10	0.09
Feb-07	3	4.85	4.71	4.72	4.82	<u>-0.14</u>	<u>-0.13</u>	<u>-0.03</u>	0.01	0.11	0.10
Mar-07	3	4.57	4.48	4.56	4.72	<u>-0.09</u>	<u>-0.01</u>	0.15	0.08	0.24	0.16
Apr-07	2.25	4.67	4.59	4.69	4.87	<u>-0.07</u>	0.03	0.20	0.10	0.27	0.17
May-07	2	4.77	4.67	4.75	4.90	<u>-0.10</u>	<u>-0.02</u>	0.14	0.08	0.23	0.16
Jun-07	2	4.98	5.03	5.10	5.20	0.05	0.12	0.22	0.08	0.18	0.10
Jul-07	2	4.82	4.88	5.00	5.11	0.07	0.19	0.29	0.12	0.22	0.10
Aug-07	2	4.31	4.43	4.67	4.93	0.12	0.36	0.62	0.24	0.50	0.26
Sep-07	2	4.01	4.20	4.52	4.79	0.19	0.51	0.78	0.32	0.59	0.27
Oct-07	1.5	3.97	4.20	4.53	4.77	0.23	0.56	0.81	0.33	0.58	0.25
Nov-07	1	3.34	3.67	4.15	4.52	0.33	0.81	1.18	0.48	0.85	0.37
Dec-07	1	3.12	3.49	4.10	4.53	0.37	0.98	1.41	0.61	1.04	0.43
Jan-08	0.25	2.48	2.98	3.74	4.33	0.50	1.27	1.85	0.76	1.35	0.59
Feb-08	0.25	1.97	2.78	3.74	4.52	0.81	1.76	2.54	0.96	1.74	0.78
Mar-08	0.25	1.62	2.48	3.51	4.39	0.87	1.89	2.78	1.03	1.91	0.88
Apr-08	0.25	2.05	2.84	3.68	4.44	0.79	1.63	2.40	0.83	1.60	0.77
May-08	0.25	2.45	3.15	3.88	4.60	0.71	1.43	2.15	0.73	1.44	0.72
Jun-08	0.25	2.77	3.49	4.10	4.69	0.71	1.33	1.92	0.61	1.20	0.59
Jul-08	0.25	2.57	3.30	4.01	4.57	0.73	1.43	2.00	0.70	1.27	0.56
Aug-08	0.25	2.42	3.14	3.89	4.50	0.72	1.47	2.08	0.74	1.36	0.62
Sep-08	0.25	2.08	2.88	3.69	4.27	0.81	1.61	2.19	0.80	1.38	0.58
Oct-08	0.25	1.61	2.73	3.81	4.17	1.11	2.20	2.56	1.09	1.45	0.36
Nov-08	0.25	1.21	2.29	3.53	4.00	1.08	2.31	2.79	1.24	1.71	0.48
Dec-08	0.25	0.82	1.52	2.42	2.87	0.70	1.60	2.05	0.89	1.35	0.45
Jan-09	0.25	0.81	1.60	2.52	3.13	0.79	1.71	2.32	0.92	1.53	0.61
Feb-09	0.25	0.98	1.87	2.87	3.59	0.90	1.89	2.61	1.00	1.72	0.72
Mar-09	0.25	0.93	1.82	2.82	3.64	0.88	1.89	2.71	1.00	1.83	0.82
Apr-09	0.25	0.93	1.86	2.93	3.76	0.93	2.00	2.83	1.07	1.90	0.83
May-09	0.25	0.93	2.13	3.29	4.23	1.20	2.36	3.30	1.16	2.09	0.93
Jun-09	0.25	1.18	2.71	3.72	4.52	1.52	2.54	3.33	1.02	1.81	0.79
Jul-09	0.25	1.02	2.46	3.56	4.41	1.44	2.54	3.39	1.10	1.94	0.84
Aug-09	0.25	1.12	2.57	3.59	4.37	1.46	2.47	3.26	1.02	1.80	0.78
Sep-09	0.25	0.96	2.37	3.40	4.19	1.41	2.45	3.23	1.03	1.82	0.78
Oct-09	0.25	0.95	2.33	3.39	4.19	1.38	2.44	3.24	1.05	1.86	0.80
Nov-09	0.25	0.80	2.23	3.40	4.31	1.43	2.60	3.51	1.17	2.08	0.91
Dec-09	0.25	0.87	2.34	3.59	4.49	1.47	2.72	3.62	1.25	2.15	0.90
Jan-10	0.25	0.93	2.48	3.73	4.60	1.56	2.80	3.68	1.25	2.12	0.87
Feb-10	0.25	0.86	2.36	3.69	4.62	1.51	2.83	3.76	1.33	2.26	0.93
Mar-10	0.25	0.96	2.43	3.73	4.64	1.47	2.77	3.69	1.29	2.21	0.92
Apr-10	0.25	1.06	2.58	3.85	4.69	1.52	2.79	3.63	1.27	2.11	0.85
May-10	0.25	0.83	2.18	3.42	4.29	1.35	2.59	3.46	1.24	2.11	0.87

**Union Electric Company**  
**Case No. ER-2019-0335**

**Average Yields of Different Treasury Securities and Average Spreads Between Yields**

Note: Shaded Date Ranges Correspond to U.S. Recessions

Underlined Spreads Correspond to Inverted Yield Curves

<b>Date</b>	<b>Rate</b>	<b>2YR</b>	<b>5YR</b>	<b>10YR</b>	<b>30YR</b>	<b>2/5 Spread</b>	<b>2/10 Spread</b>	<b>2/30 Spread</b>	<b>5/10 Spread</b>	<b>5/30 Spread</b>	<b>10/30 Spread</b>
Jun-10	0.25	0.72	2.00	3.20	4.13	1.27	2.48	3.40	1.21	2.13	0.92
Jul-10	0.25	0.62	1.76	3.01	3.99	1.15	2.39	3.38	1.25	2.23	0.98
Aug-10	0.25	0.52	1.47	2.70	3.80	0.95	2.18	3.28	1.23	2.34	1.10
Sep-10	0.25	0.48	1.41	2.65	3.77	0.93	2.17	3.29	1.24	2.36	1.13
Oct-10	0.25	0.38	1.18	2.54	3.87	0.81	2.16	3.50	1.36	2.69	1.33
Nov-10	0.25	0.45	1.35	2.76	4.19	0.90	2.31	3.73	1.41	2.84	1.42
Dec-10	0.25	0.62	1.93	3.29	4.42	1.32	2.67	3.80	1.36	2.48	1.13
Jan-11	0.25	0.61	1.99	3.39	4.52	1.38	2.78	3.91	1.40	2.53	1.13
Feb-11	0.25	0.77	2.26	3.58	4.65	1.49	2.80	3.88	1.32	2.39	1.08
Mar-11	0.25	0.70	2.11	3.41	4.51	1.42	2.72	3.82	1.30	2.40	1.10
Apr-11	0.25	0.73	2.17	3.46	4.50	1.43	2.72	3.77	1.29	2.33	1.05
May-11	0.25	0.56	1.84	3.17	4.29	1.29	2.61	3.74	1.33	2.45	1.12
Jun-11	0.25	0.41	1.58	3.00	4.23	1.17	2.59	3.82	1.42	2.65	1.23
Jul-11	0.25	0.41	1.54	3.00	4.27	1.13	2.60	3.86	1.46	2.73	1.27
Aug-11	0.25	0.23	1.02	2.30	3.65	0.79	2.07	3.42	1.28	2.63	1.35
Sep-11	0.25	0.21	0.90	1.98	3.18	0.69	1.76	2.97	1.07	2.28	1.21
Oct-11	0.25	0.28	1.06	2.15	3.13	0.78	1.87	2.85	1.09	2.07	0.98
Nov-11	0.25	0.25	0.91	2.01	3.02	0.65	1.76	2.76	1.11	2.11	1.00
Dec-11	0.25	0.26	0.89	1.98	2.98	0.63	1.72	2.73	1.09	2.09	1.00
Jan-12	0.25	0.24	0.84	1.97	3.03	0.59	1.73	2.79	1.13	2.19	1.06
Feb-12	0.25	0.28	0.83	1.97	3.11	0.55	1.69	2.83	1.14	2.28	1.14
Mar-12	0.25	0.34	1.02	2.17	3.28	0.67	1.83	2.94	1.16	2.26	1.11
Apr-12	0.25	0.29	0.89	2.05	3.18	0.60	1.76	2.89	1.16	2.29	1.13
May-12	0.25	0.29	0.76	1.80	2.93	0.48	1.52	2.65	1.04	2.17	1.13
Jun-12	0.25	0.29	0.71	1.62	2.70	0.42	1.33	2.41	0.91	1.99	1.08
Jul-12	0.25	0.25	0.62	1.53	2.59	0.37	1.28	2.34	0.91	1.97	1.06
Aug-12	0.25	0.27	0.71	1.68	2.77	0.45	1.41	2.50	0.96	2.06	1.09
Sep-12	0.25	0.26	0.67	1.72	2.88	0.41	1.47	2.63	1.05	2.21	1.16
Oct-12	0.25	0.28	0.71	1.75	2.90	0.43	1.47	2.62	1.04	2.19	1.15
Nov-12	0.25	0.27	0.67	1.65	2.80	0.40	1.39	2.54	0.99	2.14	1.15
Dec-12	0.25	0.26	0.70	1.72	2.88	0.44	1.46	2.63	1.02	2.19	1.16
Jan-13	0.25	0.27	0.81	1.91	3.08	0.54	1.65	2.82	1.11	2.28	1.17
Feb-13	0.25	0.27	0.85	1.98	3.17	0.58	1.72	2.90	1.14	2.32	1.18
Mar-13	0.25	0.26	0.82	1.96	3.16	0.56	1.70	2.91	1.14	2.34	1.21
Apr-13	0.25	0.23	0.71	1.76	2.93	0.48	1.53	2.70	1.05	2.22	1.17
May-13	0.25	0.25	0.84	1.93	3.11	0.59	1.68	2.86	1.09	2.27	1.18
Jun-13	0.25	0.33	1.20	2.30	3.40	0.87	1.97	3.07	1.10	2.20	1.10
Jul-13	0.25	0.34	1.40	2.58	3.61	1.06	2.24	3.26	1.18	2.20	1.02
Aug-13	0.25	0.36	1.52	2.74	3.76	1.16	2.38	3.40	1.22	2.24	1.02
Sep-13	0.25	0.40	1.60	2.81	3.79	1.19	2.41	3.38	1.21	2.19	0.98
Oct-13	0.25	0.34	1.37	2.62	3.68	1.03	2.28	3.34	1.25	2.31	1.06
Nov-13	0.25	0.30	1.37	2.72	3.80	1.07	2.41	3.50	1.35	2.43	1.08
Dec-13	0.25	0.34	1.58	2.90	3.89	1.24	2.56	3.55	1.33	2.31	0.99
Jan-14	0.25	0.39	1.65	2.86	3.77	1.25	2.46	3.38	1.21	2.12	0.91
Feb-14	0.25	0.33	1.52	2.71	3.66	1.19	2.38	3.34	1.19	2.15	0.95
Mar-14	0.25	0.40	1.64	2.72	3.62	1.24	2.32	3.22	1.08	1.98	0.90
Apr-14	0.25	0.42	1.70	2.71	3.52	1.28	2.29	3.10	1.00	1.82	0.81
May-14	0.25	0.39	1.59	2.56	3.39	1.20	2.17	3.00	0.97	1.80	0.83
Jun-14	0.25	0.45	1.68	2.60	3.42	1.23	2.15	2.97	0.92	1.74	0.82

**Union Electric Company**  
**Case No. ER-2019-0335**

**Average Yields of Different Treasury Securities and Average Spreads Between Yields**

Note: Shaded Date Ranges Correspond to U.S. Recessions

Underlined Spreads Correspond to Inverted Yield Curves

<b>Date</b>	<b>Rate</b>	<b>2YR</b>	<b>5YR</b>	<b>10YR</b>	<b>30YR</b>	<b>2/5 Spread</b>	<b>2/10 Spread</b>	<b>2/30 Spread</b>	<b>5/10 Spread</b>	<b>5/30 Spread</b>	<b>10/30 Spread</b>
Jul-14	0.25	0.51	1.70	2.54	3.33	1.19	2.04	2.83	0.84	1.63	0.79
Aug-14	0.25	0.47	1.63	2.42	3.20	1.16	1.95	2.73	0.79	1.57	0.78
Sep-14	0.25	0.57	1.77	2.53	3.26	1.21	1.97	2.69	0.76	1.49	0.73
Oct-14	0.25	0.45	1.55	2.30	3.04	1.10	1.86	2.59	0.76	1.49	0.74
Nov-14	0.25	0.53	1.62	2.33	3.04	1.09	1.80	2.51	0.71	1.42	0.71
Dec-14	0.25	0.64	1.64	2.21	2.83	1.00	1.57	2.20	0.57	1.19	0.63
Jan-15	0.25	0.55	1.37	1.88	2.46	0.82	1.33	1.90	0.51	1.08	0.57
Feb-15	0.25	0.62	1.47	1.98	2.57	0.85	1.36	1.95	0.50	1.09	0.59
Mar-15	0.25	0.64	1.52	2.04	2.63	0.88	1.40	1.99	0.52	1.11	0.58
Apr-15	0.25	0.54	1.35	1.94	2.59	0.81	1.40	2.05	0.58	1.23	0.65
May-15	0.25	0.61	1.54	2.20	2.96	0.93	1.59	2.35	0.66	1.42	0.76
Jun-15	0.25	0.69	1.68	2.36	3.11	1.00	1.68	2.42	0.68	1.43	0.75
Jul-15	0.25	0.67	1.63	2.32	3.07	0.96	1.66	2.40	0.69	1.43	0.74
Aug-15	0.25	0.70	1.54	2.17	2.86	0.84	1.47	2.16	0.63	1.31	0.69
Sep-15	0.25	0.71	1.49	2.17	2.95	0.78	1.46	2.24	0.68	1.46	0.78
Oct-15	0.25	0.64	1.39	2.07	2.89	0.74	1.43	2.24	0.68	1.50	0.82
Nov-15	0.25	0.88	1.67	2.26	3.03	0.79	1.38	2.15	0.59	1.36	0.77
Dec-15	0.25	0.98	1.70	2.24	2.97	0.72	1.26	1.99	0.54	1.27	0.73
Jan-16	0.5	0.90	1.52	2.09	2.86	0.62	1.19	1.96	0.57	1.34	0.77
Feb-16	0.5	0.73	1.22	1.78	2.62	0.49	1.05	1.89	0.56	1.40	0.84
Mar-16	0.5	0.88	1.38	1.89	2.68	0.50	1.01	1.81	0.51	1.31	0.80
Apr-16	0.5	0.77	1.26	1.81	2.62	0.49	1.04	1.86	0.55	1.37	0.82
May-16	0.5	0.82	1.30	1.81	2.63	0.48	0.99	1.81	0.51	1.33	0.82
Jun-16	0.5	0.73	1.17	1.64	2.45	0.44	0.91	1.72	0.48	1.29	0.81
Jul-16	0.5	0.67	1.07	1.50	2.23	0.40	0.83	1.55	0.43	1.16	0.72
Aug-16	0.5	0.74	1.13	1.56	2.26	0.40	0.82	1.52	0.42	1.13	0.71
Sep-16	0.5	0.77	1.18	1.63	2.35	0.41	0.86	1.58	0.45	1.17	0.72
Oct-16	0.5	0.84	1.27	1.76	2.50	0.43	0.92	1.66	0.49	1.23	0.74
Nov-16	0.5	0.98	1.60	2.14	2.86	0.62	1.16	1.88	0.55	1.27	0.72
Dec-16	0.5	1.20	1.96	2.49	3.11	0.76	1.30	1.92	0.53	1.15	0.62
Jan-17	0.75	1.21	1.92	2.43	3.02	0.71	1.23	1.81	0.52	1.10	0.59
Feb-17	0.75	1.20	1.90	2.42	3.03	0.70	1.22	1.83	0.52	1.13	0.61
Mar-17	0.75	1.31	2.01	2.48	3.08	0.70	1.17	1.77	0.47	1.07	0.60
Apr-17	1	1.24	1.82	2.30	2.94	0.58	1.06	1.70	0.47	1.12	0.64
May-17	1	1.30	1.84	2.30	2.96	0.54	1.00	1.66	0.47	1.12	0.66
Jun-17	1	1.34	1.77	2.19	2.80	0.43	0.84	1.45	0.41	1.02	0.61
Jul-17	1.25	1.37	1.87	2.32	2.88	0.50	0.95	1.51	0.45	1.01	0.57
Aug-17	1.25	1.34	1.78	2.21	2.80	0.44	0.87	1.46	0.43	1.02	0.59
Sep-17	1.25	1.38	1.80	2.20	2.78	0.41	0.82	1.39	0.40	0.98	0.57
Oct-17	1.25	1.55	1.98	2.36	2.88	0.43	0.81	1.33	0.38	0.90	0.52
Nov-17	1.25	1.70	2.05	2.35	2.80	0.35	0.66	1.11	0.30	0.75	0.45
Dec-17	1.25	1.84	2.18	2.40	2.77	0.34	0.56	0.92	0.22	0.59	0.37
Jan-18	1.5	2.03	2.38	2.58	2.88	0.35	0.55	0.85	0.20	0.50	0.29
Feb-18	1.5	2.18	2.60	2.86	3.13	0.42	0.68	0.96	0.26	0.53	0.27
Mar-18	1.5	2.28	2.63	2.84	3.09	0.35	0.57	0.82	0.21	0.46	0.25
Apr-18		2.38	2.70	2.87	3.07	0.32	0.49	0.69	0.17	0.37	0.20
May-18		2.51	2.82	2.98	3.13	0.31	0.47	0.62	0.16	0.31	0.15
Jun-18		2.53	2.78	2.91	3.05	0.25	0.38	0.52	0.13	0.27	0.14
Jul-18		2.61	2.78	2.89	3.01	0.17	0.28	0.40	0.11	0.23	0.12

**Union Electric Company**  
**Case No. ER-2019-0335**

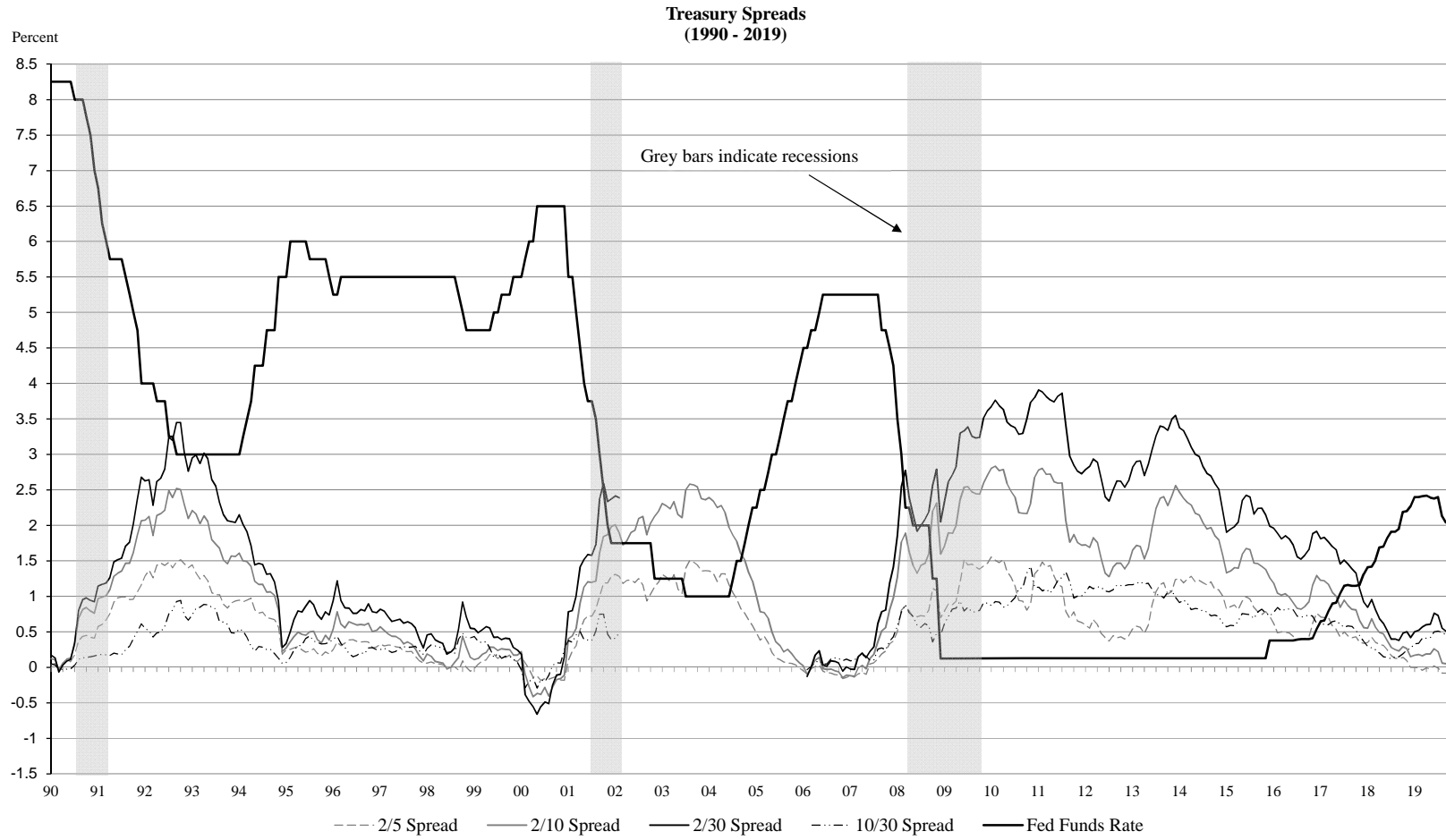
**Average Yields of Different Treasury Securities and Average Spreads Between Yields**

Note: Shaded Date Ranges Correspond to U.S. Recessions

Underlined Spreads Correspond to Inverted Yield Curves

<b>Date</b>	<b>Rate</b>	<b>2YR</b>	<b>5YR</b>	<b>10YR</b>	<b>30YR</b>	<b>2/5 Spread</b>	<b>2/10 Spread</b>	<b>2/30 Spread</b>	<b>5/10 Spread</b>	<b>5/30 Spread</b>	<b>10/30 Spread</b>
Aug-18		2.64	2.77	2.89	3.04	0.13	0.25	0.40	0.12	0.27	0.15
Sep-18		2.77	2.89	3.00	3.15	0.12	0.23	0.38	0.11	0.26	0.15
Oct-18		2.86	3.00	3.15	3.34	0.14	0.29	0.48	0.15	0.34	0.19
Nov-18		2.86	2.95	3.12	3.36	0.09	0.26	0.50	0.17	0.41	0.24
Dec-18		2.68	2.68	2.83	3.10	0.00	0.15	0.42	0.15	0.42	0.27
Jan-19		2.54	2.54	2.71	3.04	0.00	0.17	0.50	0.17	0.50	0.33
Feb-19		2.50	2.49	2.68	3.02	<u>-0.01</u>	0.18	0.52	0.19	0.53	0.34
Mar-19		2.41	2.37	2.57	2.98	<u>-0.04</u>	0.16	0.57	0.20	0.61	0.41
Apr-19		2.34	2.33	2.53	2.94	<u>-0.01</u>	0.19	0.60	0.20	0.61	0.41
May-19		2.21	2.19	2.40	2.82	<u>-0.02</u>	0.19	0.61	0.21	0.63	0.42
Jun-19		1.81	1.83	2.07	2.57	0.02	0.26	0.76	0.24	0.74	0.50
Jul-19		1.84	1.83	2.06	2.57	<u>-0.01</u>	0.22	0.73	0.23	0.74	0.51
Aug-19		1.57	1.49	1.63	2.12	<u>-0.08</u>	0.06	0.55	0.14	0.63	0.49
Sep-19		1.65	1.57	1.70	2.16	<u>-0.08</u>	0.05	0.51	0.13	0.59	0.46

Source: St. Louis Federal Reserve Bank Constant Maturity Yields Data



**Union Electric Company  
Case No. ER-2019-0335**

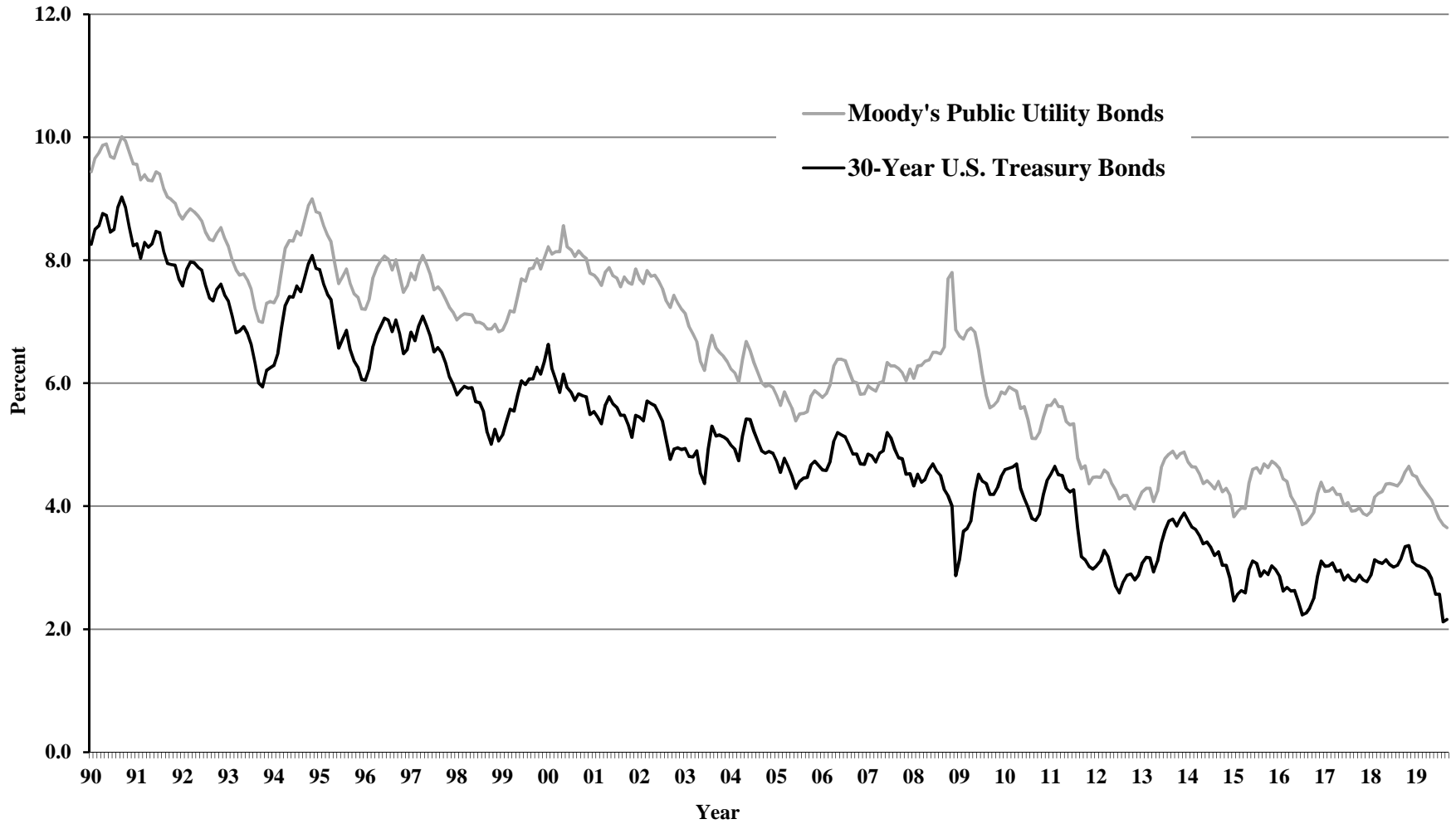
**Average Yields on Public Utility Bonds**

Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)
Jan 1990	9.44	Jan 1996	7.20	Jan 2002	7.69	Jan 2008	6.08	Jan 2014	4.72
Feb	9.66	Feb	7.37	Feb	7.62	Feb	6.28	Feb	4.64
Mar	9.75	Mar	7.72	Mar	7.83	Mar	6.29	Mar	4.63
Apr	9.87	Apr	7.88	Apr	7.74	Apr	6.36	Apr	4.52
May	9.89	May	7.99	May	7.76	May	6.38	May	4.37
Jun	9.69	Jun	8.07	Jun	7.67	Jun	6.50	Jun	4.42
Jul	9.66	Jul	8.02	Jul	7.54	Jul	6.50	Jul	4.35
Aug	9.84	Aug	7.84	Aug	7.34	Aug	6.48	Aug	4.29
Sep	10.01	Sep	8.01	Sep	7.23	Sep	6.59	Sep	4.40
Oct	9.94	Oct	7.76	Oct	7.43	Oct	7.70	Oct	4.24
Nov	9.76	Nov	7.48	Nov	7.31	Nov	7.80	Nov	4.29
Dec	9.57	Dec	7.58	Dec	7.20	Dec	6.87	Dec	4.18
Jan 1991	9.56	Jan 1997	7.79	Jan 2003	7.13	Jan 2009	6.77	Jan 2015	3.83
Feb	9.31	Feb	7.68	Feb	6.92	Feb	6.72	Feb	3.91
Mar	9.39	Mar	7.92	Mar	6.80	Mar	6.85	Mar	3.97
Apr	9.30	Apr	8.08	Apr	6.68	Apr	6.90	Apr	3.96
May	9.29	May	7.94	May	6.35	May	6.83	May	4.38
Jun	9.44	Jun	7.77	Jun	6.21	Jun	6.54	Jun	4.60
Jul	9.40	Jul	7.52	Jul	6.54	Jul	6.15	Jul	4.63
Aug	9.16	Aug	7.57	Aug	6.78	Aug	5.80	Aug	4.54
Sep	9.03	Sep	7.50	Sep	6.58	Sep	5.60	Sep	4.68
Oct	8.99	Oct	7.37	Oct	6.50	Oct	5.64	Oct	4.63
Nov	8.93	Nov	7.24	Nov	6.44	Nov	5.71	Nov	4.73
Dec	8.76	Dec	7.16	Dec	6.36	Dec	5.86	Dec	4.69
Jan 1992	8.67	Jan 1998	7.03	Jan 2004	6.23	Jan 2010	5.83	Jan 2016	4.62
Feb	8.77	Feb	7.09	Feb	6.17	Feb	5.94	Feb	4.44
Mar	8.84	Mar	7.13	Mar	6.01	Mar	5.90	Mar	4.40
Apr	8.79	Apr	7.12	Apr	6.38	Apr	5.87	Apr	4.16
May	8.72	May	7.11	May	6.68	May	5.59	May	4.06
Jun	8.64	Jun	6.99	Jun	6.53	Jun	5.62	Jun	3.93
Jul	8.46	Jul	6.99	Jul	6.34	Jul	5.41	Jul	3.70
Aug	8.34	Aug	6.96	Aug	6.18	Aug	5.10	Aug	3.73
Sep	8.32	Sep	6.88	Sep	6.01	Sep	5.10	Sep	3.80
Oct	8.44	Oct	6.88	Oct	5.95	Oct	5.20	Oct	3.90
Nov	8.53	Nov	6.96	Nov	5.97	Nov	5.45	Nov	4.21
Dec	8.36	Dec	6.84	Dec	5.93	Dec	5.61	Dec	4.39
Jan 1993	8.23	Jan 1999	6.87	Jan 2005	5.80	Jan 2011	5.69	Jan 2017	4.24
Feb	8.00	Feb	7.00	Feb	5.64	Feb	5.82	Feb	4.25
Mar	7.85	Mar	7.18	Mar	5.86	Mar	5.74	Mar	4.30
Apr	7.76	Apr	7.16	Apr	5.72	Apr	5.76	Apr	4.19
May	7.78	May	7.42	May	5.60	May	5.57	May	4.19
Jun	7.68	Jun	7.70	Jun	5.39	Jun	5.52	Jun	4.01
Jul	7.53	Jul	7.66	Jul	5.50	Jul	5.61	Jul	4.06
Aug	7.21	Aug	7.86	Aug	5.51	Aug	5.26	Aug	3.92
Sep	7.01	Sep	7.87	Sep	5.54	Sep	5.01	Sep	3.93
Oct	6.99	Oct	8.02	Oct	5.79	Oct	5.11	Oct	3.97
Nov	7.30	Nov	7.86	Nov	5.88	Nov	5.00	Nov	3.92
Dec	7.33	Dec	8.04	Dec	5.83	Dec	4.96	Dec	3.93
Jan 1994	7.31	Jan 2000	8.22	Jan 2006	5.77	Jan 2012	4.97	Jan 2018	3.97
Feb	7.44	Feb	8.10	Feb	5.83	Feb	4.99	Feb	3.88
Mar	7.83	Mar	8.14	Mar	5.98	Mar	5.13	Mar	3.85
Apr	8.20	Apr	8.14	Apr	6.28	Apr	5.05	April	4.24
May	8.32	May	8.55	May	6.39	May	4.84	May	4.36
Jun	8.31	Jun	8.22	Jun	6.39	Jun	4.67	Jun	4.37
Jul	8.47	Jul	8.17	Jul	6.37	Jul	4.56	Jul	4.35
Aug	8.41	Aug	8.05	Aug	6.20	Aug	4.71	August	4.33
Sep	8.65	Sep	8.16	Sep	6.03	Sep	4.75	Sep	4.41
Oct	8.88	Oct	8.08	Oct	6.01	Oct	4.69	Oct	4.56
Nov	9.00	Nov	8.03	Nov	5.82	Nov	4.53	Nov	4.65
Dec	8.79	Dec	7.79	Dec	5.83	Dec	4.28	Dec	4.51
Jan 1995	8.77	Jan 2001	7.76	Jan 2007	5.96	Jan 2013	4.45	Jan 2019	4.48
Feb	8.56	Feb	7.69	Feb	5.91	Feb	4.49	Feb	4.35
Mar	8.41	Mar	7.59	Mar	5.87	Mar	4.45	Mar	4.26
Apr	8.30	Apr	7.81	Apr	6.01	Apr	4.19	April	4.18
May	7.93	May	7.88	May	6.03	May	4.36	May	4.10
Jun	7.62	Jun	7.75	Jun	6.34	Jun	4.70	Jun	3.93
Jul	7.73	Jul	7.71	Jul	6.28	Jul	4.90	Jul	3.79
Aug	7.86	Aug	7.57	Aug	6.28	Aug	5.00	August	3.70
Sep	7.62	Sep	7.73	Sep	6.24	Sep	5.05	Sep	3.65
Oct	7.46	Oct	7.64	Oct	6.17	Oct	4.94		
Nov	7.40	Nov	7.61	Nov	6.04	Nov	5.04		
Dec	7.21	Dec	7.86	Dec	6.23	Dec	4.89		

Source:

Mergent Bond Record (through November 2010); BondsOnline (December 2010 - November 2013); Mergent Bond Record (December 2013 - Present).

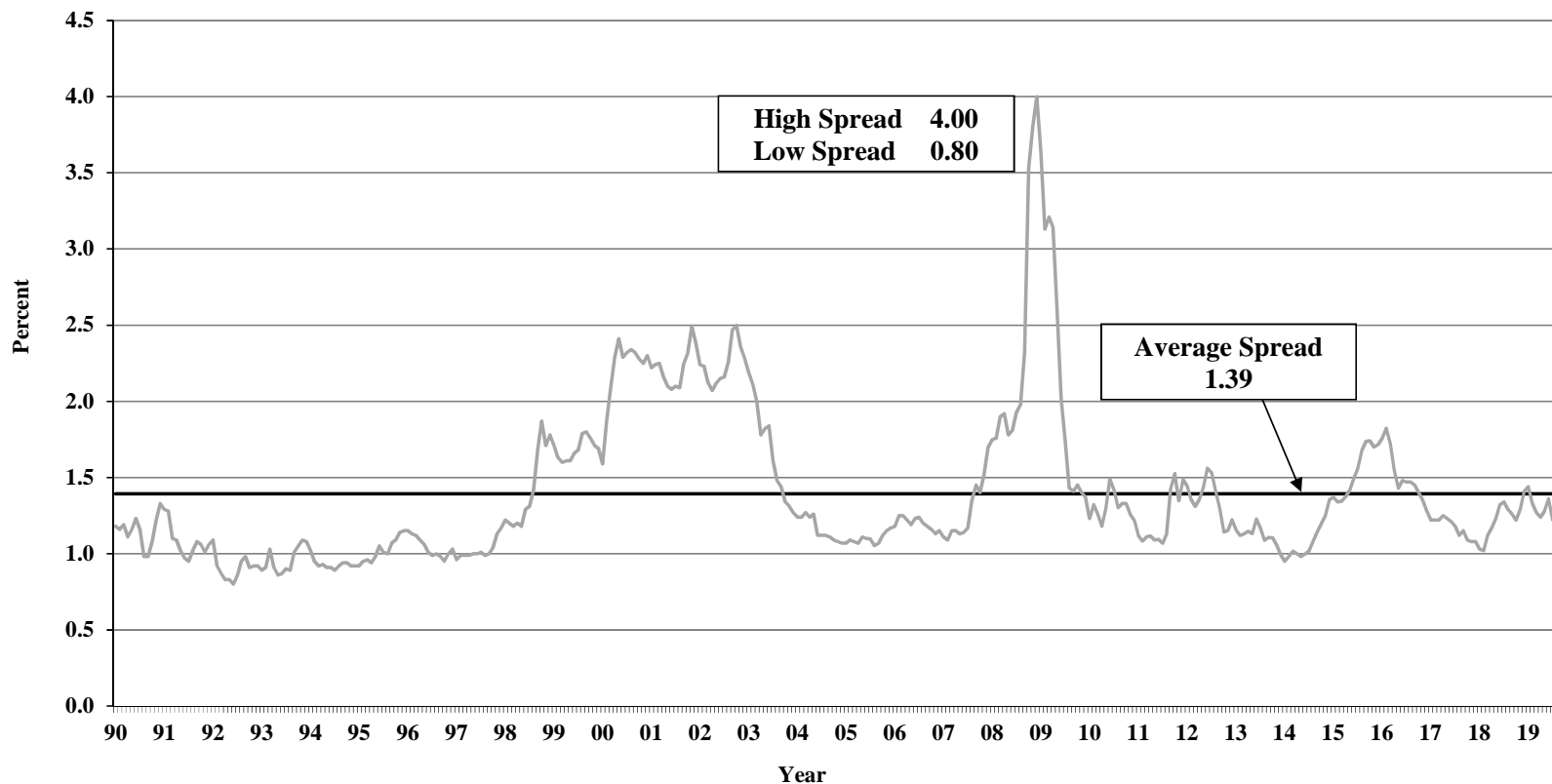
**Average Yields on Public Utility Bonds and  
30-Year U.S. Treasury Bonds (1990 - 2019)**





**Union Electric Company**  
**Case No. ER-2019-0335**

**Average Spreads Between Yields on Public Utility Bonds and  
30-Year U.S. Treasury Bonds (1990 - 2019)**



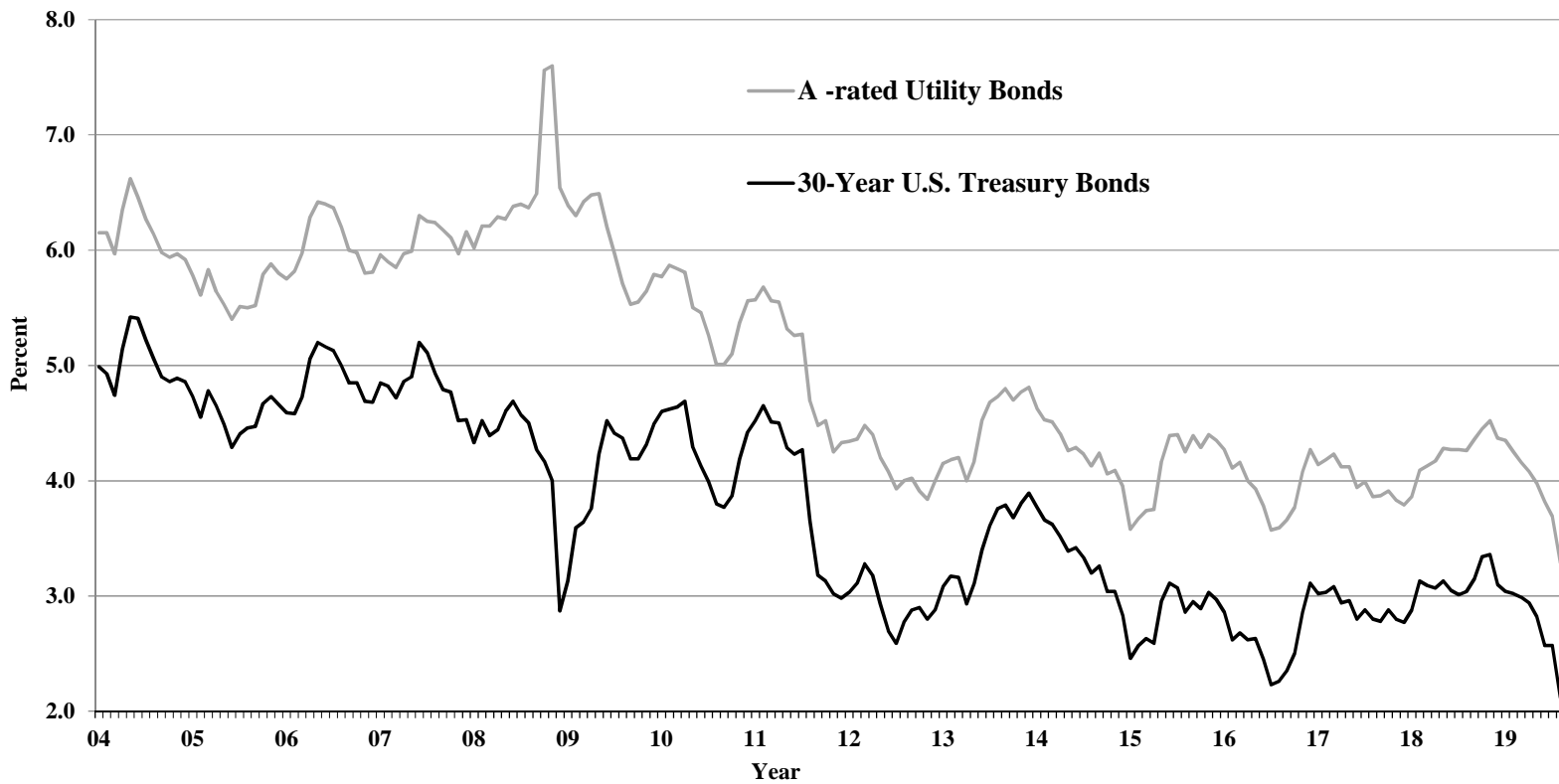
**Union Electric Company  
Case No. ER-2019-0335**

**Average Yields on A rated Public Utility Bonds**

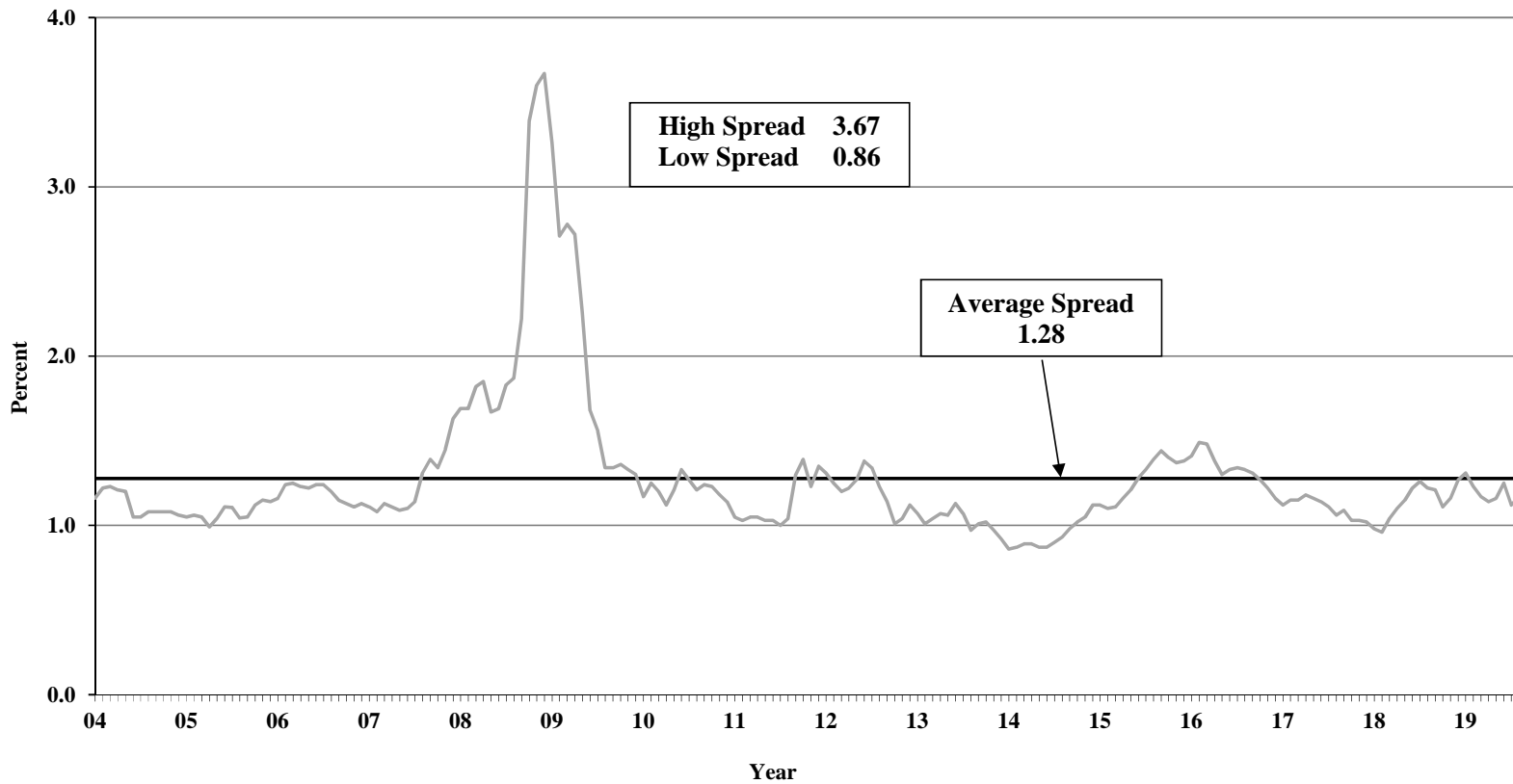
Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)
Jan 2004	6.15	Jan 2008	6.02	Jan 2012	4.34	Jan 2016	4.27
Feb	6.15	Feb	6.21	Feb	4.36	Feb	4.11
Mar	5.97	Mar	6.21	Mar	4.48	Mar	4.16
Apr	6.35	Apr	6.29	Apr	4.40	Apr	4.00
May	6.62	May	6.27	May	4.20	May	3.93
Jun	6.46	Jun	6.38	Jun	4.08	Jun	3.78
Jul	6.27	Jul	6.40	Jul	3.93	Jul	3.57
Aug	6.14	Aug	6.37	Aug	4.00	Aug	3.59
Sep	5.98	Sep	6.49	Sep	4.02	Sep	3.66
Oct	5.94	Oct	7.56	Oct	3.91	Oct	3.77
Nov	5.97	Nov	7.60	Nov	3.84	Nov	4.08
Dec	5.92	Dec	6.54	Dec	4.00	Dec	4.27
Jan 2005	5.78	Jan 2009	6.39	Jan 2013	4.15	Jan 2017	4.14
Feb	5.61	Feb	6.30	Feb	4.18	Feb	4.18
Mar	5.83	Mar	6.42	Mar	4.20	Mar	4.23
Apr	5.64	Apr	6.48	Apr	4.00	Apr	4.12
May	5.53	May	6.49	May	4.17	May	4.12
Jun	5.40	Jun	6.20	Jun	4.53	Jun	3.94
Jul	5.51	Jul	5.97	Jul	4.68	Jul	3.99
Aug	5.50	Aug	5.71	Aug	4.73	Aug	3.86
Sep	5.52	Sep	5.53	Sep	4.80	Sep	3.87
Oct	5.79	Oct	5.55	Oct	4.70	Oct	3.91
Nov	5.88	Nov	5.64	Nov	4.77	Nov	3.83
Dec	5.80	Dec	5.79	Dec	4.81	Dec	3.79
Jan 2006	5.75	Jan 2010	5.77	Jan 2014	4.63	Jan 2018	3.86
Feb	5.82	Feb	5.87	Feb	4.53	Feb	4.09
Mar	5.98	Mar	5.84	Mar	4.51	Mar	4.13
Apr	6.29	Apr	5.81	Apr	4.41	Apr	4.17
May	6.42	May	5.50	May	4.26	May	4.28
Jun	6.40	Jun	5.46	Jun	4.29	Jun	4.27
Jul	6.37	Jul	5.26	Jul	4.23	Jul	4.27
Aug	6.20	Aug	5.01	Aug	4.13	Aug	4.26
Sep	6.00	Sep	5.01	Sep	4.24	Sep	4.36
Oct	5.98	Oct	5.10	Oct	4.06	Oct	4.45
Nov	5.80	Nov	5.37	Nov	4.09	Nov	4.52
Dec	5.81	Dec	5.56	Dec	3.95	Dec	4.37
Jan 2007	5.96	Jan 2011	5.57	Jan 2015	3.58	Jan 2019	4.35
Feb	5.90	Feb	5.68	Feb	3.67	Feb	4.25
Mar	5.85	Mar	5.56	Mar	3.74	Mar	4.16
Apr	5.97	Apr	5.55	Apr	3.75	April	4.08
May	5.99	May	5.32	May	4.17	May	3.98
Jun	6.30	Jun	5.26	Jun	4.39	Jun	3.82
Jul	6.25	Jul	5.27	Jul	4.40	July	3.69
Aug	6.24	Aug	4.69	Aug	4.25	Aug	3.29
Sep	6.18	Sep	4.48	Sep	4.39	Sep	3.37
Oct	6.11	Oct	4.52	Oct	4.29		
Nov	5.97	Nov	4.25	Nov	4.40		
Dec	6.16	Dec	4.33	Dec	4.35		

Source: Mergent Bond Record (through November 2010); BondsOnline (December 2010 - November 2013);  
Mergent Bond Record (December 2013 - Present).

**Average Yields on A -rated Utility Bonds and 30-Year U.S. Treasury Bonds  
From (2004 - 2019)**



**Average Spreads Between Yields on A-rated Public Utility Bonds  
and 30-Year U.S. Treasury Bonds (2004 - 2019)**



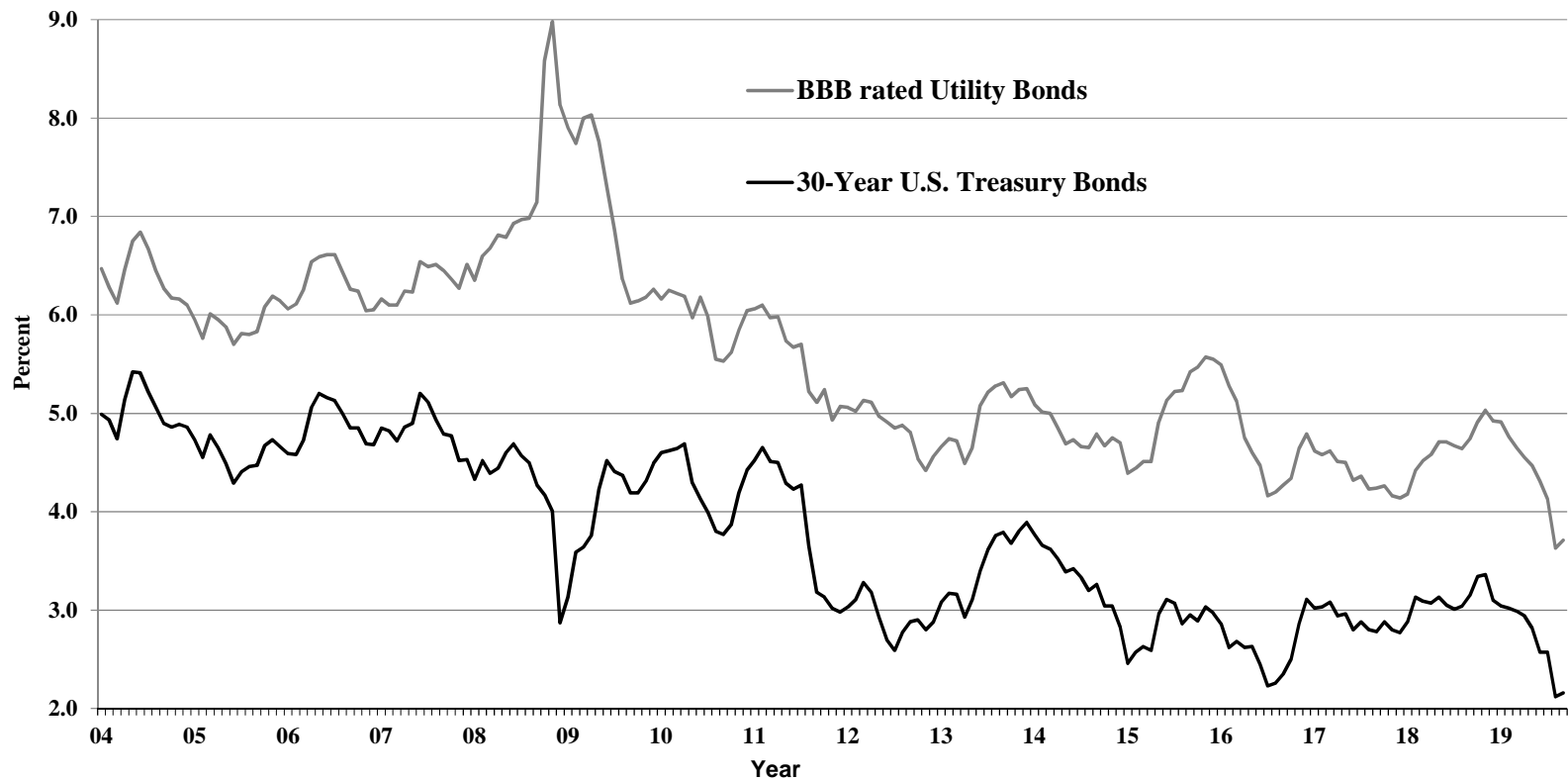
**Union Electric Company  
Case No. ER-2019-0335**

**Average Yields on BBB rated Public Utility Bonds**

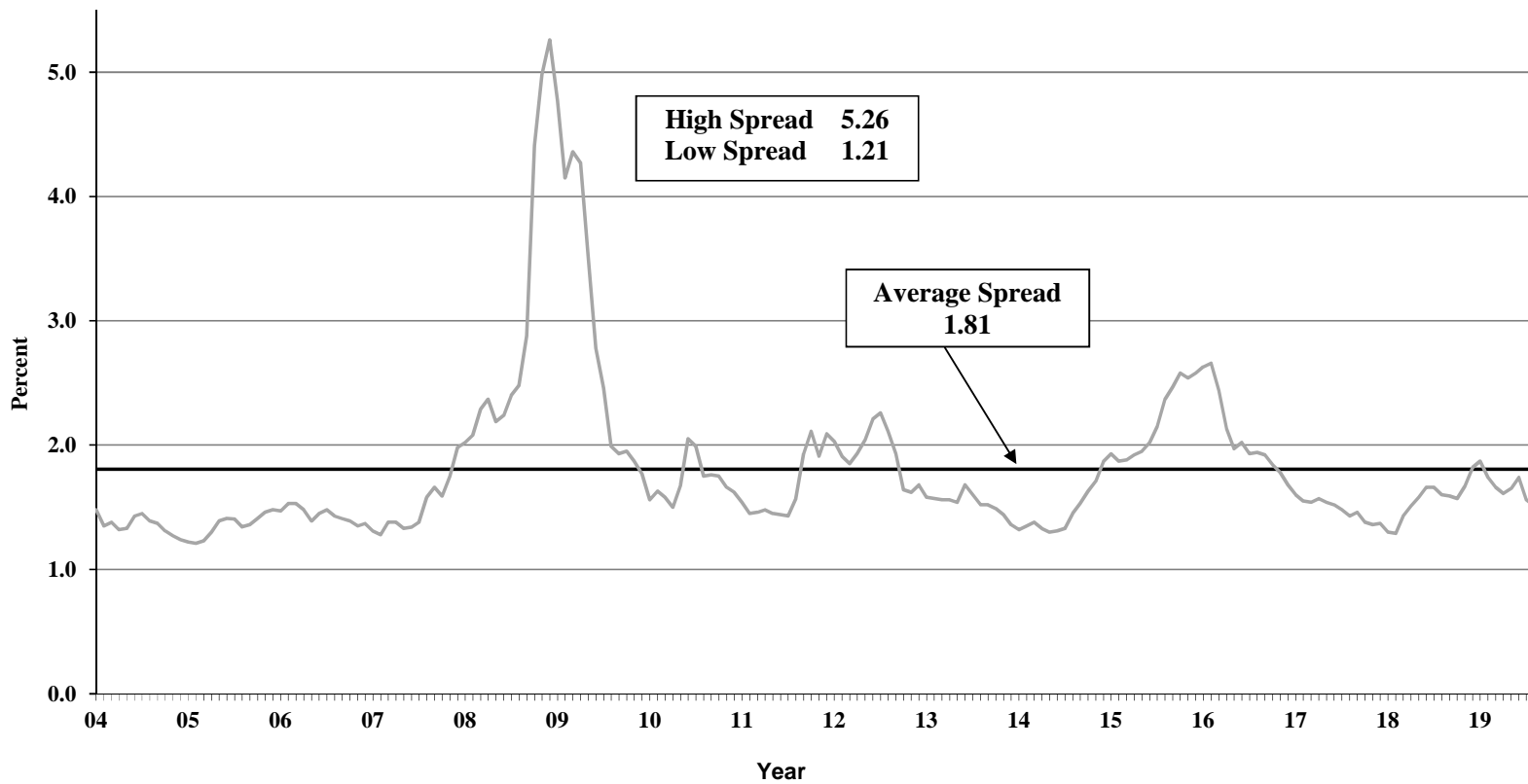
Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)	Mo/Year	Rate (%)
Jan 2004	6.47	Jan 2008	6.35	Jan 2012	5.06	Jan 2016	5.49
Feb	6.28	Feb	6.60	Feb	5.02	Feb	5.28
Mar	6.12	Mar	6.68	Mar	5.13	Mar	5.12
Apr	6.46	Apr	6.81	Apr	5.11	Apr	4.75
May	6.75	May	6.79	May	4.97	May	4.60
Jun	6.84	Jun	6.93	Jun	4.91	Jun	4.47
Jul	6.67	Jul	6.97	Jul	4.85	Jul	4.16
Aug	6.45	Aug	6.98	Aug	4.88	Aug	4.20
Sep	6.27	Sep	7.15	Sep	4.81	Sep	4.27
Oct	6.17	Oct	8.58	Oct	4.54	Oct	4.34
Nov	6.16	Nov	8.98	Nov	4.42	Nov	4.64
Dec	6.10	Dec	8.13	Dec	4.56	Dec	4.79
Jan 2005	5.95	Jan 2009	7.90	Jan 2013	4.66	Jan 2017	4.62
Feb	5.76	Feb	7.74	Feb	4.74	Feb	4.58
Mar	6.01	Mar	8.00	Mar	4.72	Mar	4.62
Apr	5.95	Apr	8.03	Apr	4.49	Apr	4.51
May	5.88	May	7.76	May	4.65	May	4.50
Jun	5.70	Jun	7.30	Jun	5.08	Jun	4.32
Jul	5.81	Jul	6.87	Jul	5.21	Jul	4.36
Aug	5.80	Aug	6.36	Aug	5.28	Aug	4.23
Sep	5.83	Sep	6.12	Sep	5.31	Sep	4.24
Oct	6.08	Oct	6.14	Oct	5.17	Oct	4.26
Nov	6.19	Nov	6.18	Nov	5.24	Nov	4.16
Dec	6.14	Dec	6.26	Dec	5.25	Dec	4.14
Jan 2006	6.06	Jan 2010	6.16	Jan 2014	5.09	Jan 2018	4.18
Feb	6.11	Feb	6.25	Feb	5.01	Feb	4.42
Mar	6.26	Mar	6.22	Mar	5.00	Mar	4.52
Apr	6.54	Apr	6.19	Apr	4.85	Apr	4.58
May	6.59	May	5.97	May	4.69	May	4.71
Jun	6.61	Jun	6.18	Jun	4.73	Jun	4.71
Jul	6.61	Jul	5.98	Jul	4.66	Jul	4.67
Aug	6.43	Aug	5.55	Aug	4.65	Aug	4.64
Sep	6.26	Sep	5.53	Sep	4.79	Sep	4.74
Oct	6.24	Oct	5.62	Oct	4.67	Oct	4.91
Nov	6.04	Nov	5.85	Nov	4.75	Nov	5.03
Dec	6.05	Dec	6.04	Dec	4.70	Dec	4.92
Jan 2007	6.16	Jan 2011	6.06	Jan 2015	4.39	Jan 2019	4.91
Feb	6.10	Feb	6.10	Feb	4.44	Feb	4.76
Mar	6.10	Mar	5.97	Mar	4.51	Mar	4.65
Apr	6.24	Apr	5.98	Apr	4.51	April	4.55
May	6.23	May	5.74	May	4.91	May	4.47
Jun	6.54	Jun	5.67	Jun	5.13	Jun	4.31
Jul	6.49	Jul	5.70	Jul	5.22	Jul	4.13
Aug	6.51	Aug	5.22	Aug	5.23	Aug	3.63
Sep	6.45	Sep	5.11	Sep	5.42	Sep	3.71
Oct	6.36	Oct	5.24	Oct	5.47		
Nov	6.27	Nov	4.93	Nov	5.57		
Dec	6.51	Dec	5.07	Dec	5.55		

Source: Mergent Bond Record (through November 2010); BondsOnline (December 2010 - November 2013);  
Mergent Bond Record (December 2013 - Present).

**Average Yields on BBB rated Utility Bonds and 30-Year U.S. Treasury Bonds  
From (2004 - 2019)**



**Average Spreads Between Yields on BBB rated Public Utility Bonds  
and 30-Year U.S. Treasury Bonds (2004 - 2019)**





**Union Electric Company  
Case No. ER-2019-0335**

**Criteria for Selecting Comparable Electric Utility Companies**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(12)	
		Stock Publicly Traded	80% of Assets U.S. Regulated (EEI)	At Least Investment Grade Credit Rating (2 of 3 agencies)	L- T Growth Coverage from at least 2 equity analysts and L-T Growth Available	No Pending Merger or Acquisition	No Reduced Dividend Since 2016	At Least 80% of Income from U.S. Regulated Utility Operations	At least 50% of Plant from Electric Utility	At least 25% of Plant Electric Plant Generation	Comparable Company Met All Criteria
Edison Electric Institute Power Companies	Ticker										
ALLETE, Inc.	ALE	YES	NO								
Alliant Energy Corporation	LNT	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Ameren Corporation <sup>1</sup>	AEE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
American Electric Power Company, Inc.	AEP	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
AVANGRID, Inc.	AGR	YES	NO								
Avista Corporation	AVA	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Black Hills Corporation	BKH	YES	YES	YES	YES	YES	YES	YES	NO		
CenterPoint Energy, Inc.	CNP	YES	NO								
CMS Energy Corporation	CMS	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Consolidated Edison, Inc.	ED	YES	YES	YES	YES	YES	YES	YES	YES	NO	
Dominion Resources, Inc.	D	YES	NO								
DTE Energy Company	DTE	YES	NO								
Duke Energy Corporation	DUK	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Edison International	EIX	YES	YES	YES	YES	YES	YES	YES	YES	NO	
El Paso Electric Company	EE	YES	YES	YES	YES	NO					
Entergy Corporation <sup>2</sup>	ETR	YES	YES	YES	YES	YES	YES	YES	YES	YES	
Evergy, Inc.	EVRG	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Eversource Energy	ES	YES	YES	YES	YES	YES	YES	YES	YES	NO	
Exelon Corporation	EXC	YES	NO								
FirstEnergy Corp.	FE	YES	YES	YES	YES	YES	YES	YES	YES	NO	
Hawaiian Electric Industries, Inc.	HE	YES	NO								
IDACORP, Inc.	IDA	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
MDU Resources Group, Inc.	MDU	YES	NO								
MGE Energy, Inc.	MGEE	YES	NO								
NextEra Energy, Inc.	NEE	YES	NO								
NiSource Inc.	NI	YES	YES	YES	YES	YES	YES	YES	NO		
NorthWestern Corporation	NWE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
OGE Energy Corp.	OGE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Otter Tail Corporation	OTTR	YES	YES	YES	NO						
PG&E Corporation	PCG	YES	YES	NO							
Pinnacle West Capital Corporation	PNW	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
PNM Resources, Inc.	PNM	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Portland General Electric Company	POR	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
PPL Corporation	PPL	YES	YES	YES	YES	YES	YES	NO			
Public Service Enterprise Group Inc.	PEG	YES	NO								
SCANA Corporation	SCG	YES	YES	YES	NO						
Sempra Energy	SRE	YES	NO								
Southern Company	SO	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Unitil Corporation	UTL	YES	YES	YES	YES	YES	YES	YES	NO		
Vectren Corporation	VVC	YES	YES	NO							
WEC Energy Group, Inc.	WEC	YES	YES	YES	YES	YES	NO				
Xcel Energy, Inc.	XEL	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Sources: Columns 1, 2, 3, 4 = Edison Electric Institute  
Column 5,6,7,8,9,10,11 = SNL Finance

Notes: <sup>1</sup> Ameren appears in Staff's Schedules for reference. Staff's analysis of the proxy group excludes Ameren Data.

<sup>2</sup> Entergy Corporation was not included because losses from its wholesale commodities business have led to considerable volatility in revenues, compared to the proxy group.

**Union Electric Company**  
**Case No. ER-2019-0335**

**Comparable Electric Utility Companies  
for Union Electric Company**

Number	Ticker Symbol	Company Name	S&P Corporate Credit Rating
1	LNT	Alliant Energy Corporation	A-
2	AEE	Ameren Corporation	BBB+
3	AEP	American Electric Power Company, Inc.	A-
4	AVA	Avista Corporation	BBB
5	CMS	CMS Energy Corporation	BBB+
6	DUK	Duke Energy Corporation	A-
8	EVRG	Evergy, Inc.	A-
9	IDA	IDACORP, Inc.	BBB
10	NWE	NorthWestern Corporation	BBB
11	OGE	OGE Energy Corp.	BBB+
12	PNW	Pinnacle West Capital Corporation	A-
13	PNM	PNM Resources, Inc.	BBB+
14	POR	Portland General Electric Company	BBB+
15	SO	Southern Company	A-
16	XEL	Xcel Energy, Inc.	A-
<b>Average</b>			<b>BBB+</b>

Note: Ameren appears in Staff's Schedules for reference. Staff's analysis of the proxy group excludes Ameren Data.

**Union Electric Company  
Case No. ER-2019-0335**

**Spire Missouri Gas Proxy Group  
Credit Ratings**

Number	Ticker Symbol	Company Name	S&P Corporate Credit Rating
1	ATO	Atmos Energy Corporation	A
2	NWN	Northwest Natural Holding Company	A+
3	OGS	One Gas, Inc.	A
4	SWX	Southwest Gas Holdings, Inc.	BBB+
5	SR	Spire, Inc.	A-
		<b>Average</b>	<hr style="width: 100%; border: 0.5px solid black;"/> <b>A</b>

**Union Electric Company  
Case No. ER-2019-0335**

**Historical Capital Structures Including Current Portions of Long-Term Debt - Goodwill:**

**Ameren**

*(Dollars in thousands)*

Capital Components	2011	2012	2013	2014	2015	2016	2017	2018
Long-Term Debt <sup>1</sup>	\$ 5,762	\$ 5,887	\$ 5,768	\$ 5,935	\$ 7,005	\$ 7,006	\$ 7,665	\$ 8,169
Preferred Stock	\$ 142	\$ 142	\$ 142	\$ 142	\$ 142	\$ 142	\$ 142	\$ 142
Equity <sup>2</sup>	\$ 7,508	\$ 6,205	\$ 6,133	\$ 6,302	\$ 6,535	\$ 6,692	\$ 6,773	\$ 7,220
<b>Total</b>	<b>\$ 13,412</b>	<b>\$ 12,234</b>	<b>\$ 12,043</b>	<b>\$ 12,379</b>	<b>\$ 13,682</b>	<b>\$ 13,840</b>	<b>\$ 14,580</b>	<b>\$ 15,531</b>

**ATXI**

*(Dollars in thousands)*

Capital Components	2011	2012	2013	2014	2015	2016	2017	2018
Long-Term Debt <sup>1</sup>	0	\$ 37	\$ 51	\$ 100	\$ 290	\$ 350	\$ 525	\$ 525
Preferred Stock	NA	NA	NA	NA	NA	NA	NA	NA
Equity <sup>2</sup>	\$ 28	\$ 32	\$ 63	\$ 124	\$ 343	\$ 477	\$ 658	\$ 660
<b>Total</b>	<b>\$ 28</b>	<b>\$ 69</b>	<b>\$ 114</b>	<b>\$ 224</b>	<b>\$ 633</b>	<b>\$ 827</b>	<b>\$ 1,183</b>	<b>\$ 1,185</b>

**Ameren Illinois**

*(Dollars in thousands)*

Capital Components	2011	2012	2013	2014	2015	2016	2017	2018
Long-Term Debt <sup>1</sup>	\$ 1,658	\$ 1,727	\$ 1,856	\$ 2,224	\$ 2,471	\$ 2,588	\$ 2,830	\$ 3,296
Preferred Stock	\$ 62	\$ 62	\$ 62	\$ 62	\$ 62	\$ 62	\$ 62	\$ 62
Equity <sup>2</sup>	\$ 1,979	\$ 1,928	\$ 1,975	\$ 2,188	\$ 2,424	\$ 2,561	\$ 2,837	\$ 3,301
<b>Total</b>	<b>\$ 3,699</b>	<b>\$ 3,717</b>	<b>\$ 3,893</b>	<b>\$ 4,474</b>	<b>\$ 4,957</b>	<b>\$ 5,211</b>	<b>\$ 5,729</b>	<b>\$ 6,659</b>

**Ameren Missouri**

*(Dollars in thousands)*

Capital Components	2011	2012	2013	2014	2015	2016	2017	2018
Long-Term Debt <sup>1</sup>	\$ 3,680	\$ 3,736	\$ 3,487	\$ 3,711	\$ 3,840	\$ 3,724	\$ 3,691	\$ 3,728
Preferred Stock	\$ 80	\$ 80	\$ 80	\$ 80	\$ 80	\$ 80	\$ 80	\$ 80
Equity <sup>2</sup>	\$ 3,957	\$ 3,974	\$ 3,913	\$ 3,972	\$ 4,002	\$ 4,010	\$ 4,001	\$ 4,149
<b>Total</b>	<b>\$ 7,717</b>	<b>\$ 7,790</b>	<b>\$ 7,480</b>	<b>\$ 7,763</b>	<b>\$ 7,922</b>	<b>\$ 7,814</b>	<b>\$ 7,772</b>	<b>\$ 7,957</b>

Notes: 1. Includes current maturities on long-term debt.

2. Minus goodwill.

Source: Market Intelligence

**Union Electric Company  
Case No. ER-2019-0335**

**Historical Capital Structures Including Current Portion of Long-Term Debt - Goodwill**

<b>Ameren</b>									
<i>(in percentages)</i>									
Capital Components	2011	2012	2013	2014	2015	2016	2017	2018	<b>8 Year Average</b>
Long-Term Debt <sup>1</sup>	42.96%	48.12%	47.90%	47.94%	51.20%	50.62%	52.57%	52.60%	<b>49.24%</b>
Preferred Stock	1.06%	1.16%	1.18%	1.15%	1.04%	1.03%	0.97%	0.91%	<b>1.06%</b>
Equity <sup>2</sup>	55.98%	50.72%	50.93%	50.91%	47.76%	48.35%	46.45%	46.49%	<b>49.70%</b>
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	<b>100.00%</b>

<b>ATXI</b>									
<i>(in percentages)</i>									
Capital Components	2011	2012	2013	2014	2015	2016	2017	2018	<b>8 Year Average</b>
Long-Term Debt <sup>1</sup>	0.00%	53.62%	44.74%	44.72%	45.78%	42.33%	44.38%	44.30%	<b>44.30%</b>
Preferred Stock	NA	NA	NA	NA	NA	NA	NA	NA	NA
Equity <sup>2</sup>	100.00%	46.38%	55.26%	55.28%	54.22%	57.67%	55.62%	55.70%	<b>55.70%</b>
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	<b>100.00%</b>

<b>Ameren Illinois</b>									
<i>(in percentages)</i>									
Capital Components	2011	2012	2013	2014	2015	2016	2017	2018	<b>8 Year Average</b>
Long-Term Debt <sup>1</sup>	44.82%	46.46%	47.68%	49.71%	49.85%	49.66%	49.40%	49.50%	<b>49.62%</b>
Preferred Stock	1.68%	1.67%	1.59%	1.39%	1.25%	1.19%	1.08%	0.93%	<b>1.17%</b>
Equity <sup>2</sup>	53.50%	51.87%	50.73%	48.90%	48.90%	49.15%	49.52%	49.57%	<b>49.21%</b>
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	<b>100.00%</b>

<b>Ameren Missouri</b>									
<i>(in percentages)</i>									
Capital Components	2011	2012	2013	2014	2015	2016	2017	2018	<b>8 Year Average</b>
Long-Term Debt <sup>1</sup>	47.69%	47.96%	46.62%	47.80%	48.47%	47.66%	47.49%	46.85%	<b>47.66%</b>
Preferred Stock	1.04%	1.03%	1.07%	1.03%	1.01%	1.02%	1.03%	1.01%	<b>1.02%</b>
Equity <sup>2</sup>	51.28%	51.01%	52.31%	51.17%	50.52%	51.32%	51.48%	52.14%	<b>51.32%</b>
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	<b>100.00%</b>

Notes: 1. Includes current maturities on long-term debt.

2. Minus goodwill.

Sources: Ameren's SEC 10-K for 2014, 2015, 2016, 2017, & 2018

**Union Electric Company**  
**Case No. ER-2019-0335**

**Staff Recommended Capital Structure for Ameren Missouri as of June 30, 2019**

Capital Component	Percentage of Capital
Long-Term Debt	49.02%
Preferred Stock	0.98%
Common Equity <sup>2</sup>	50.00%
Total Capitalization	100.00%

% Capital Structure for **Ameren** as of June 30, 2019 <sup>1</sup>

Capital Component	Percentage of Capital
Long-Term Debt	52.53%
Preferred Stock	0.90%
Common Equity	46.58%
Total Capitalization	100.00%

% Capital Structure for **ATXI** as of June 30, 2019 <sup>1</sup>

Capital Component	Percentage of Capital
Long-Term Debt	43.37%
Preferred Stock	NA
Common Equity	56.63%
Total Capitalization	100.00%

% Capital Structure for **Ameren Illinois** as of June 30, 2019 <sup>1</sup>

Capital Component	Percentage of Capital
Long-Term Debt	48.18%
Preferred Stock	0.91%
Common Equity	50.91%
Total Capitalization	100.00%

% Capital Structure for **Ameren Missouri** as of June 30, 2019 <sup>1</sup>

Capital Component	Percentage of Capital
Long-Term Debt	47.57%
Preferred Stock	0.98%
Common Equity <sup>2</sup>	51.45%
Total Capitalization	100.00%

Source: 1. Market Intelligence

Notes: 2. Reduces common equity to Staff's recommended equity ratio, the reasonable level agreed to by Ameren and the Illinois Commerce Commission for Ameren's Illinois operations.

**Union Electric Company  
Case No. ER-2019-0335**

**Embedded Cost of Long-Term Debt as of June 30, 2019 for**

**Ameren**

Total Annual Cost:	\$357,759,670
Total Carrying Value:	\$8,179,601,785
Embedded Cost = Total Annual Cost/Total Carrying Value	<b>4.37%</b>

**ATXI**

Total Annual Cost:	\$357,759,670
Total Carrying Value:	\$8,179,601,785
Embedded Cost = Total Annual Cost/Total Carrying Value	<b>3.56%</b>

**Ameren Illinois**

Total Annual Cost:	\$135,243,843
Total Carrying Value:	\$3,279,235,529
Embedded Cost = Total Annual Cost/Total Carrying Value	<b>4.45%</b>

**Ameren Missouri**

Total Annual Cost:	\$180,614,476
Total Carrying Value:	\$3,811,196,134
Embedded Cost = Total Annual Cost/Total Carrying Value	<b>4.60%</b>

Sources: Company response to Staff Data Request No. 0381

**Union Electric Company  
Case No. ER-2019-00335**

**Ten-Year Dividends Per Share, Earnings Per Share & Book Value Per Share Growth Rates  
for the Comparable Electric Utility Companies**

Company Name	----- 10-Year Annual Compound Growth Rates -----			
	DPS	EPS	BVPS	Average of Growth Rates
Alliant Energy Corporation	7.05%	2.38%	4.13%	<b>4.52%</b>
Ameren Corporation <sup>1</sup>	-3.49%	-0.39%	-0.74%	<b>-1.54%</b>
American Electric Power Company, Inc.	4.30%	0.28%	3.98%	<b>2.85%</b>
Avista Corporation	8.75%	5.37%	4.09%	<b>6.07%</b>
CMS Energy Corporation	21.73%	NM	4.62%	<b>13.17%</b>
Duke Energy Corporation	1.47%	2.29%	0.97%	<b>1.57%</b>
Evergy, Inc.	NA	NA	NA	<b>NA</b>
IDACORP, Inc.	6.44%	7.11%	5.30%	<b>6.28%</b>
NorthWestern Corporation	5.08%	9.56%	5.67%	<b>6.77%</b>
OGE Energy Corp.	6.42%	6.12%	7.25%	<b>6.60%</b>
Pinnacle West Capital Corporation	2.70%	4.78%	2.63%	<b>3.37%</b>
PNM Resources, Inc.	2.17%	NM	0.03%	<b>1.10%</b>
Portland General Electric Company	4.57%	3.19%	2.73%	<b>3.50%</b>
Southern Company	3.72%	-1.75%	4.15%	<b>2.04%</b>
Xcel Energy, Inc.	4.67%	5.05%	4.38%	<b>4.70%</b>
<b>Average</b>	<b>6.08%</b>	<b>4.03%</b>	<b>3.84%</b>	<b>4.81%</b>

NA = Not Available

Source: Market Intelligence

Notes: 1 Ameren appears in Staff's Schedules for reference. Staff's analysis of the proxy group excludes Ameren Data.



**Union Electric Company**  
**Case No. ER-2019-0335**

**Five-Year Dividends Per Share, Earnings Per Share & Book Value Per Share Growth Rates**  
**for the Comparable Electric Utility Companies**

Company Name	----- 5-Year Annual Compound Growth Rates -----			-----
	DPS	EPS	BVPS	Average of Growth Rates
Alliant Energy Corporation	7.01%	4.99%	5.10%	<b>5.70%</b>
Ameren Corporation <sup>1</sup>	2.35%	6.31%	0.73%	<b>3.13%</b>
American Electric Power Company, Inc.	4.83%	0.34%	3.25%	<b>2.81%</b>
Avista Corporation	4.27%	4.75%	4.67%	<b>4.56%</b>
CMS Energy Corporation	7.24%	4.47%	5.25%	<b>5.65%</b>
Duke Energy Corporation	2.90%	2.42%	1.26%	<b>2.19%</b>
Evergy, Inc.	NA	NA	NA	<b>NA</b>
IDACORP, Inc.	10.17%	3.85%	5.12%	<b>6.38%</b>
NorthWestern Corporation	7.25%	6.84%	7.80%	<b>7.29%</b>
OGE Energy Corp.	9.67%	4.66%	5.95%	<b>6.76%</b>
Pinnacle West Capital Corporation	3.06%	4.73%	4.25%	<b>4.01%</b>
PNM Resources, Inc.	11.11%	-4.94%	0.83%	<b>2.33%</b>
Portland General Electric Company	4.54%	5.12%	3.63%	<b>4.43%</b>
Southern Company	3.44%	-4.80%	3.01%	<b>0.55%</b>
Xcel Energy, Inc.	6.10%	4.80%	4.42%	<b>5.11%</b>
<b>Average</b>	<b>6.28%</b>	<b>2.86%</b>	<b>4.19%</b>	<b>4.44%</b>

Source: Market Intelligence

Notes: 1 Ameren appears in Staff's Schedules for reference. Staff's analysis of the proxy group excludes Ameren Data.

**Union Electric Company  
Case No. ER-2019-0335**

**Historical and Projected Growth Rates  
for the Comparable Electric Utility Companies**

Company Name	(1) 10-Year Average DPS, EPS & BVPS	(2) 5-Year Average DPS, EPS & BVPS	(3) Mean Projected Long-Term Growth Rate
Alliant Energy Corporation	4.52%	5.70%	5.66%
Ameren Corporation <sup>1</sup>	-1.54%	3.13%	6.28%
American Electric Power Company, Inc.	2.85%	2.81%	5.82%
Avista Corporation	6.07%	4.56%	3.98%
CMS Energy Corporation	13.17%	5.65%	6.89%
Duke Energy Corporation	1.57%	2.19%	4.57%
Evergy, Inc.	NA	NA	6.17%
IDACORP, Inc.	6.28%	6.38%	3.50%
NorthWestern Corporation	6.77%	7.29%	3.41%
OGE Energy Corp.	6.60%	6.76%	5.18%
Pinnacle West Capital Corporation	3.37%	4.01%	5.29%
PNM Resources, Inc.	1.10%	2.33%	6.03%
Portland General Electric Company	3.50%	4.43%	4.84%
Southern Company	2.04%	0.55%	4.52%
Xcel Energy, Inc.	4.70%	5.11%	5.57%
<b>Average</b>	<b>4.81%</b>	<b>4.44%</b>	<b>5.10%</b>

**Proposed Range of Growth for Comparables:**

**4.20% - 5.00%**

Sources: Column 1 = Schedule 8-1 Market Intelligence

Column 2 = Schedule 8-2 Market Intelligence

Column 3 = Market Intelligence as of September, 2019

Notes: 1 Ameren appears in Staff's Schedules for reference. Staff's analysis of the proxy group excludes Ameren Data.

**Union Electric Company  
Case No. ER-2019-0335**

**Ten-Year Dividends Per Share, Earnings Per Share & Book Value Per Share Growth Rates  
for the Spire Missouri Gas Proxy Group**

Company Name	----- 10-Year Annual Compound Growth Rates -----			Average of Growth Rates
	DPS	EPS	BVPS	
Atmos Energy Corporation	3.51%	7.92%	5.72%	<b>5.71%</b>
Northwest Natural Holding Company	2.64%	-0.99%	1.85%	<b>1.17%</b>
One Gas Inc.	NA	NA	NA	<b>NA</b>
Southwest Gas Holdings, Inc.	7.72%	7.23%	5.41%	<b>6.79%</b>
Spire Inc.	3.74%	4.55%	7.44%	<b>5.24%</b>
<b>Average</b>	<b>4.40%</b>	<b>4.68%</b>	<b>5.10%</b>	<b>4.73%</b>

NA = Not Available

Source: Market Intelligence

**Union Electric Company  
Case No. ER-2019-0335**

**Five-Year Dividends Per Share, Earnings Per Share & Book Value Per Share Growth Rates  
for the Spire Missouri Gas Proxy Group**

Company Name	----- DPS	5-Year Annual Compound Growth Rates			----- Average of Growth Rates
	EPS	BVPS			
Atmos Energy Corporation	5.54%	12.89%	7.25%	<b>8.56%</b>	
Northwest Natural Holding Company	1.03%	0.55%	0.11%	<b>0.57%</b>	
One Gas Inc.	NA	NA	NA	<b>NA</b>	
Southwest Gas Holdings, Inc.	10.48%	5.21%	6.13%	<b>7.27%</b>	
Spire Inc.	4.85%	7.49%	8.12%	<b>6.82%</b>	
<b>Average</b>	<b>5.47%</b>	<b>6.54%</b>	<b>5.40%</b>	<b>5.81%</b>	

Source: Market Intelligence

**Union Electric Company  
Case No. ER-2019-0335**

**Historical and Projected Growth Rates  
for the Spire Missouri Gas Proxy Group**

Company Name	(1) 10-Year Average DPS, EPS & BVPS	(2) 5-Year Average DPS, EPS & BVPS	(3) Mean Projected Long-Term Growth Rate
Atmos Energy Corporation	5.71%	8.56%	5.00%
Northwest Natural Holding Company	1.17%	0.57%	4.50%
One Gas Inc.	NA	NA	6.00%
Southwest Gas Holdings, Inc.	6.79%	7.27%	6.50%
Spire Inc.	5.24%	6.82%	6.00%
<b>Average</b>	<b>4.73%</b>	<b>5.81%</b>	<b>5.60%</b>

**Proposed Range of Growth for Comparables: 4.20% - 5.00%**

Sources: Column 1 = Schedule 8-1  
Column 2 = Schedule 8-2  
Column 3 = Market Intelligence as of September, 2019

**Union Electric Company  
Case No. ER-2019-0335**

**Constant-Growth Discounted Cash Flow (DCF) Estimated Costs of Common Equity  
for the Comparable Electric Utility Companies**

Company Name	(1) Expected Annual Dividend	(2) Average High/Low Stock Price	(3) Projected Dividend Yield
Alliant Energy Corporation	\$1.49	\$51.22	2.90%
Ameren Corporation <sup>1</sup>	\$2.02	\$76.52	2.63%
American Electric Power Company, Inc.	\$2.82	\$90.77	3.11%
Avista Corporation	\$1.60	\$46.54	3.43%
CMS Energy Corporation	\$1.61	\$60.69	2.65%
Duke Energy Corporation	\$3.88	\$90.95	4.27%
Evergy, Inc.	\$2.01	\$63.14	3.19%
IDACORP, Inc.	\$2.62	\$106.33	2.47%
NorthWestern Corporation	\$2.38	\$72.13	3.30%
OGE Energy Corp.	\$1.58	\$43.25	3.65%
Pinnacle West Capital Corporation	\$3.13	\$93.97	3.33%
PNM Resources, Inc.	\$1.37	\$50.34	2.72%
Portland General Electric Company	\$1.60	\$55.68	2.87%
Southern Company	\$2.52	\$57.89	4.36%
Xcel Energy, Inc.	\$1.68	\$62.34	2.70%
<b>Average</b>			<b>3.17%</b>

**Proposed Dividend Yield:**

**Proposed Range of Growth:**

**4.20% - 5.00%**

**Indicated Cost of Common Equity:**

**7.37% - 8.17%**

Sources: Column 1 and 2 = Market Intelligence

Column 1 = Expected Annual Dividend based on the sum of equity analysts' expected next four quarters DPS.

Column 3 = Projected Dividend Yield = ( Column 1 / Column 2 )

Notes: 1 Ameren appears in Staff's Schedules for reference. Staff's analysis of the proxy group excludes Ameren Data.

**Union Electric Company  
Case No. ER-2019-0335**

**Current Constant-Growth Discounted Cash Flow (DCF) Estimated Costs of Common Equity  
for the Comparable Gas Utility Companies Staff Presented in the Spire Missouri Rate Cases**

	(1)	(2)	(3)
Company Name	Expected Annual Dividend	Average High/Low Stock Price	Projected Dividend Yield
Atmos Energy Corporation	\$2.23	\$109.14	2.04%
Northwest Natural Holding Company	\$1.91	\$70.75	2.70%
One Gas, Inc.	\$2.12	\$91.11	2.33%
Southwest Gas Holdings, Inc.	\$2.27	\$89.94	2.53%
Spire, Inc.	\$2.47	\$84.19	2.93%
<b>Average</b>			<b>2.51%</b>
<b>Proposed Dividend Yield:</b>			<b>2.51%</b>
<b>Proposed Range of Growth:</b>			<b>4.20% - 5.00%</b>
<b>Indicated Cost of Common Equity:</b>			<b>6.71% - 7.51%</b>

Notes: Column 1 = Expected Annual Dividend based on the sum of equity analysts' expected next four quarters DPS.  
Column 3 = Projected Dividend Yield = ( Column 1 / Column 2 )

**Union Electric Company  
Case No. ER-2019-0335**

**Constant-Growth Discounted Cash Flow (DCF) Estimated Costs of Common Equity  
for the Comparable Gas Utility Companies Staff Presented in the Spire Missouri Rate Cases**

Company Name	(1) Expected Annual Dividend	(2) Average High/Low Stock Price	(3) Projected Dividend Yield
Atmos Energy Corporation	\$1.89	\$82.04	2.31%
Northwest Natural Holding Company	\$1.89	\$60.46	3.13%
One Gas, Inc.	\$1.76	\$69.73	2.52%
Southwest Gas Holdings, Inc.	\$2.03	\$79.89	2.53%
Spire, Inc.	\$2.15	\$69.85	3.07%
<b>Average</b>			<b>2.71%</b>

**Proposed Dividend Yield: 2.71%**

**Proposed Range of Growth: 4.20% - 5.00%**

**Indicated Cost of Common Equity: 6.91% - 7.71%**

Notes: Column 1 = Expected Annual Dividend based on the sum of equity analysts' expected next four quarters DPS.  
Column 3 = Projected Dividend Yield = ( Column 1 / Column 2 )

Source: Case Nos. GR-2017-0215 & GR-2017-0216, Staff Report, Cost of Service, Appendix 2, Shedule 10.



**Union Electric Company  
ER-2019-0335**

**Capital Asset Pricing Model (CAPM) Costs of Common Equity Estimates  
Based on Historical Return Differences Between Common Stocks and Long-Term U.S. Treasuries  
for the Comparable Electric Utility Companies**

Company Name	(1) Risk Free Rate	(2) Company's Value Line Beta	(3) Geometric Average Market Risk Premium (1926-2018)	(4) Arithmetic Average Market Risk Premium (1926-2018)	(5) Geometric CAPM Cost of Common Equity (1926-2018)	(6) Arithmetic CAPM Cost of Common Equity (1926-2018)
Alliant Energy Corporation	2.29%	0.55	4.50%	6.00%	4.77%	5.60%
Ameren Corporation <sup>1</sup>	2.29%	0.54	4.50%	6.00%	4.71%	5.52%
American Electric Power Company, Inc.	2.29%	0.49	4.50%	6.00%	4.50%	5.23%
Avista Corporation	2.29%	0.55	4.50%	6.00%	4.77%	5.60%
CMS Energy Corporation	2.29%	0.50	4.50%	6.00%	4.53%	5.27%
Duke Energy Corporation	2.29%	0.46	4.50%	6.00%	4.35%	5.03%
Evergy, Inc.	2.29%	0.40	4.50%	6.00%	4.08%	4.67%
IDACORP, Inc.	2.29%	0.52	4.50%	6.00%	4.62%	5.40%
NorthWestern Corporation	2.29%	0.54	4.50%	6.00%	4.74%	5.56%
OGE Energy Corp.	2.29%	0.73	4.50%	6.00%	5.55%	6.64%
Pinnacle West Capital Corporation	2.29%	0.48	4.50%	6.00%	4.47%	5.19%
PNM Resources, Inc.	2.29%	0.54	4.50%	6.00%	4.74%	5.56%
Portland General Electric Company	2.29%	0.52	4.50%	6.00%	4.62%	5.40%
Southern Company	2.29%	0.46	4.50%	6.00%	4.35%	5.03%
Xcel Energy, Inc.	2.29%	0.46	4.50%	6.00%	4.35%	5.03%
<b>Average</b>		<b>0.52</b>			<b>4.61%</b>	<b>5.38%</b>

Column 1 = The appropriate yield is equal to the average 30-year U.S. Treasury Bond yield for July, August, and September 2019 which was obtained from the St. Louis Federal Reserve website at <http://research.stlouisfed.org/fred2/series/GS30/22>.

Column 2 = Beta is a measure of the movement and relative risk of an individual stock to the market as a whole generate by the SNL Beta Stock Generator September 30, 2014 through September 30, 2019.

Column 3 = The Market Risk Premium represents the expected return from holding the entire market portfolio less the expected return from holding a risk free investment. The appropriate Market Risk Premium for the period 1926 - 2018 was determined to be 4.50% based on a geometric average as calculated in Duff & Phelps' 2019 SBBI Yearbook.

Column 4 = The Market Risk Premium represents the expected return from holding the entire market portfolio less the expected return from holding a risk free investment. The appropriate Market Risk Premium for the period 1926 - 2018 was determined to be 6.00% based on an arithmetic average as calculated in Duff & Phelps' 2019 SBBI Yearbook.

Column 5 = (Column 1 + (Column 2 \* Column 3))

Column 6 = (Column 1 + (Column 2 \* Column 4))

Notes: 1 Ameren appears in Staff's Schedules for reference. Staff's analysis of the proxy group excludes Ameren Data.

**Union Electric Company  
ER-2019-0335**

**Current Capital Asset Pricing Model (CAPM) Costs of Common Equity Estimates  
Based on Historical Return Differences Between Common Stocks and Long-Term U.S. Treasuries  
for the Comparable Gas Utility Companies Staff Presented in the Spire Missouri Rate Cases**

Company Name	(1) Risk Free Rate	(2) Company's Value Line Beta	(3) Geometric Average Market Risk Premium (1926-2018)	(4) Arithmetic Average Market Risk Premium (1926-2018)	(5) Geometric CAPM Cost of Common Equity (1926-2018)	(6) Arithmetic CAPM Cost of Common Equity (1926-2018)
Atmos Energy Corporation	2.29%	0.57	4.50%	6.00%	4.86%	5.72%
Northwest Natural Holding Company	2.29%	0.52	4.50%	6.00%	4.62%	5.40%
One Gas, Inc.	2.29%	0.58	4.50%	6.00%	4.92%	5.80%
Southwest Gas Holdings, Inc.	2.29%	0.63	4.50%	6.00%	5.13%	6.08%
Spire, Inc.	2.29%	0.60	4.50%	6.00%	4.98%	5.88%
<b>Average</b>		<b><u>0.58</u></b>			<b><u>4.90%</u></b>	<b><u>5.77%</u></b>

Column 1 = The appropriate yield is equal to the average 30-year U.S. Treasury Bond yield for July, August and September 2019, which was obtained from the St. Louis Federal Reserve website at <http://research.stlouisfed.org/fred2/series/GS30/22>

Column 2 = Beta is a measure of the movement and relative risk of an individual stock to the market as a whole generate by the SNL Beta Stock Generator September 30, 2014 through September 30, 2019.

Column 3 = The Market Risk Premium represents the expected return from holding the entire market portfolio less the expected return from holding a risk free investment. The appropriate Market Risk Premium for the period 1926 - 2018 was determined to be 6.00% based on an arithmetic average as calculated in Duff & Phelps' 2019 SBBI Yearbook.

Column 4 = The Market Risk Premium represents the expected return from holding the entire market portfolio less the expected return from holding a risk free investment. The appropriate Market Risk Premium for the period 1926 - 2018 was determined to be 4.50% based on a geometric average as calculated in Duff & Phelps' 2019 SBBI Yearbook.

Column 5 = (Column 1 + (Column 2 \* Column 3)).

Column 6 = (Column 1 + (Column 2 \* Column 4)).

**Union Electric Company  
ER-2019-0335**

**Capital Asset Pricing Model (CAPM) Costs of Common Equity Estimates Staff Presented in the Spire Rate Cases  
Based on Historical Return Differences Between Common Stocks and Long-Term U.S. Treasuries  
for the Comparable Gas Utility Companies**

Company Name	(1) Risk Free Rate	(2) Company's Value Line Beta	(3) Geometric Average Market Risk Premium (1926-2016)	(4) Arithmetic Average Market Risk Premium (1926-2016)	(5) Geometric CAPM Cost of Common Equity (1926-2016)	(6) Arithmetic CAPM Cost of Common Equity (1926-2016)
Atmos Energy Corporation	2.90%	0.71	4.50%	6.00%	6.10%	7.17%
Northwest Natural Holding Company	2.90%	0.66	4.50%	6.00%	5.89%	6.89%
One Gas, Inc.	2.90%	0.77	4.50%	6.00%	6.37%	7.53%
Southwest Gas Holdings, Inc.	2.90%	0.71	4.50%	6.00%	6.10%	7.17%
Spire, Inc.	2.90%	0.69	4.50%	6.00%	5.92%	6.93%
<b>Average</b>		<b>0.71</b>			<b>6.08%</b>	<b>7.14%</b>

Source: Case Nos. GR-2017-0215 & GR-2017-0216, Staff Report, Cost of Service, Appendix 2, Shedule 11.

Column 1 = The appropriate yield is equal to the average 30-year U.S. Treasury Bond yield for April, May and June 2017, which was obtained from the St. Louis Federal Reserve website at <http://research.stlouisfed.org/fred2/series/GS30/22>

Column 2 = Beta is a measure of the movement and relative risk of an individual stock to the market as a whole generate by the SNL Beta Stock Generator June 30, 2012 through June 30, 2017.

Column 3 = The Market Risk Premium represents the expected return from holding the entire market portfolio less the expected return from holding a risk free investment. The appropriate Market Risk Premium for the period 1926 - 2016 was determined to be 6.00% based on an arithmetic average as calculated in Valuation Handbook by Duff & Phelps.

Column 4 = The Market Risk Premium represents the expected return from holding the entire market portfolio less the expected return from holding a risk free investment. The appropriate Market Risk Premium for the period 1926 - 2016 was determined to be 4.50% based on a geometric average as calculated in Valuation Handbook by Duff & Phelps.

Column 5 = (Column 1 + (Column 2 \* Column 3)).

Column 6 = (Column 1 + (Column 2 \* Column 4)).

**Union Electric Company  
ER-2019-0335**

**Summary of Staff's Cost of Equity Estimates**

**Staff's Current Cost of Equity Estimates for the Electric Proxy Group**

<u>DCF Range of Growth %</u>	<u>4.20%</u>	<u>5.00%</u>	<u>Average</u>
DCF	7.37%	8.17%	<b>7.77%</b>
	<u>Geometric</u>	<u>Arithmetic</u>	<u>Average</u>
CAPM	4.61%	5.38%	<b>5.00%</b>
		<b>Average</b>	<b>6.38%</b>

**Staff's Current Cost of Equity Estimates for the Gas Proxy Group**

<u>DCF Range of Growth %</u>	<u>4.20%</u>	<u>5.00%</u>	<u>Average</u>
DCF	6.71%	7.51%	<b>7.11%</b>
	<u>Geometric</u>	<u>Arithmetic</u>	<u>Average</u>
CAPM	4.90%	5.77%	<b>5.34%</b>
		<b>Average</b>	<b>6.22%</b>

**Staff's Cost of Equity Estimates for the Gas Proxy Group in the Spire Missouri Cases**

<u>DCF Range of Growth %</u>	<u>4.20%</u>	<u>5.00%</u>	<u>Average</u>
DCF	6.91%	7.71%	<b>7.31%</b>
	<u>Geometric</u>	<u>Arithmetic</u>	<u>Average</u>
CAPM	6.08%	7.14%	<b>6.61%</b>
		<b>Average</b>	<b>6.96%</b>

Average COE Difference Between Current Electric and Gas Proxy Groups <sup>1</sup>	<b>0.16%</b>
Difference in Average COE for Gas Proxy Group Between Rate Cases <sup>2</sup>	<b>-0.74%</b>
Implied COE Differential for Electric Proxy Group	<b>-0.58%</b>
Commission allowed ROE in Spire Missouri rate cases	<b>9.80%</b>
Implied COE Differential for Electric Proxy Group	<b>-0.58%</b>
Staff recommended allowed ROE for Ameren Missouri Electric <sup>3</sup>	<b>9.22%</b>

Notes:

1. COE for current Electric Proxy (6.38) - COE for Current Gas Proxy (6.22)
2. COE for Gas Proxy during Spire Missouri rate cases (6.96) - COE for Gas Proxy during current case (6.22)
3. Staff rounded the recommendation up to 9.25%.
4. Staff's estimate of Ameren Missouri's market bases COE is 6.17%  $((6.83 + 7.63 + 4.71 + 5.52)/4)$

**Union Electric Company  
ER-2019-0335**

**Recommended Allowed Rate of Return as of June 30, 2019  
for  
Ameren Missouri**

Capital Component	Percentage of Capital	Embedded Cost	Allowed Rate of Return Common Equity Return of:		
			<b>8.75%</b>	<b>9.25%</b>	<b>9.75%</b>
Long-Term Debt	49.02%	4.60%	2.26%	2.26%	2.26%
Preferred Stock	0.98%	4.18%	0.04%	0.04%	0.04%
Common Equity	<u>50.00%</u>		<u>4.38%</u>	<u>4.63%</u>	<u>4.88%</u>
Total	<b><u>100.00%</u></b>		<b><u>6.67%</u></b>	<b><u>6.92%</u></b>	<b><u>7.17%</u></b>