AG-DR-01-043

REQUEST:

Provide a schedule of FTEs and payroll dollars separated between expense, capital, and other, for DEBS by department and by month for 2016, 2017, 2018, budgeted in each month 2019, actual in each month 2019 for which actual information is available, and budgeted in each month 2020.

RESPONSE:

Payroll Dollars:

See AG-DR-01-043 Attachment 1 for dollars separated between expense, capital, and other, for DEBS by department and by month for the periods requested.

Actual Headcounts:

See AG-DR-01-043 Attachment 2 for actual headcounts by month by department for 2016 – September 2019.

Budgeted Headcounts:

The Company does not budget headcount.

PERSON RESPONSIBLE: Renee H. Metzler

	Payroll Labor Costs (Budgeted 2020) - F			
	Expense	Capital	Other deferred	Total
January	$ 38,648,515	$ 14,344,872	$ 3,161,944	$ 56,155,331
February	24,840,209	3,620,937	2,995,403	31,456,549
March	25,757,771	3,736,106	3,078,805	32,572,682
April	25,584,569	3,797,105	3,007,532	32,389,205
May	25,628,763	3,819,758	3,024,716	32,473,237
June	25,557,211	3,876,347	3,023,116	32,456,674
July	25,591,824	3,761,312	3,042,744	32,395,880
August	25,712,565	3,721,687	3,120,839	32,555,091
September	26,197,945	3,693,295	3,024,294	32,915,535
October	26,373,065	3,725,546	3,027,473	33,126,083
November	26,441,127	3,707,010	3,009,900	33,158,037
December	28,030,478	3,853,135	3,026,945	34,910,558
Total	**$ 324,364,042**	**$ 55,657,110**	**$ 36,543,710**	**$ 416,564,863**

	Payroll Labor Costs (Budgeted 2019) - E			
	Expense	Capital	Other deferred	Total
January	$ 25,732,095	$ 4,128,670	$ 2,905,013	$ 32,765,778
February	25,364,631	4,157,318	2,848,260	32,370,209
March	26,933,489	4,462,627	3,802,119	35,198,235
April	25,991,290	4,315,538	2,890,525	33,197,353
May	25,949,048	4,345,255	2,895,729	33,190,032
June	26,324,056	4,318,047	2,895,746	33,537,849
July	26,246,639	4,284,700	2,895,846	33,427,186
August	26,813,642	4,480,261	3,821,706	35,115,610
September	26,256,649	4,276,535	2,895,671	33,428,855
October	26,392,746	4,358,684	2,918,055	33,669,484
November	26,351,989	4,326,625	2,918,509	33,597,123
December	26,647,397	4,313,383	2,930,635	33,891,415
Total	**$ 315,003,671**	**$ 51,767,643**	**$ 36,617,814**	**$ 403,389,129**

	Payroll Labor Costs (Actual through Sept 2019) - D			
	Expense	Capital	Other deferred	Total
January	$ 20,738,790	$ 1,045,255	$ 1,760,134	$ 23,544,179
February	22,620,700	1,140,981	2,328,554	26,090,235
March	23,017,616	1,275,357	3,110,321	27,403,294

April	22,067,906	1,361,966	2,164,375	25,594,247
May	21,024,780	1,489,538	2,318,146	24,832,463
June	22,350,995	1,808,174	1,164,211	25,323,379
July	18,933,979	1,148,814	2,054,080	22,136,873
August	20,963,115	2,226,638	3,110,027	26,299,780
September	18,918,122	1,385,256	2,078,776	22,382,154
October				
November				
December				
Total	**$ 190,636,002**	**$ 12,881,980**	**$ 20,088,622**	**$ 223,606,605**

	Payroll Labor Costs (2018) C			
	Expense	**Capital**	**Other deferred**	**Total**
January	$ 20,489,890	$ 697,883	$ 1,746,386	$ 22,934,159
February	22,085,602	816,554	2,171,169	25,073,326
March	23,067,626	920,003	2,883,310	26,870,939
April	23,301,563	867,039	2,078,089	26,246,692
May	22,987,925	943,152	2,114,809	26,045,886
June	23,239,213	1,139,519	1,986,029	26,364,761
July	20,315,796	800,481	1,934,840	23,051,116
August	23,909,842	1,002,998	2,930,072	27,842,911
September	22,499,595	944,781	868,527	24,312,903
October	22,693,522	1,837,439	2,127,169	26,658,131
November	21,342,847	973,515	2,079,752	24,396,114
December	16,889,495	2,600,578	1,289,886	20,779,960
Total	**$ 262,822,916**	**$ 13,543,943**	**$ 24,210,038**	**$ 300,576,897**

	Payroll Labor Costs (2017) B			
	Expense	**Capital**	**Other deferred**	**Total**
January	$ 17,666,590	$ 484,922	$ 1,645,832	$ 19,797,344
February	18,629,960	667,758	2,148,751	21,446,470
March	20,515,881	918,929	2,761,982	24,196,792
April	18,808,584	713,077	1,915,351	21,437,012
May	19,211,165	915,286	1,970,738	22,097,189
June	19,700,665	849,369	1,882,268	22,432,302
July	17,278,785	666,529	1,848,500	19,793,814
August	19,216,512	814,822	2,104,606	22,135,940
September	20,289,815	775,165	1,890,546	22,955,527
October	20,497,471	874,751	2,532,935	23,905,156

November	19,583,338	641,307	1,575,011	21,799,656
December	13,119,388	1,463,647	1,602,612	16,185,648
Total	**$ 224,518,156**	**$ 9,785,563**	**$ 23,879,133**	**$ 258,182,852**

	Payroll Labor Costs (2016) A			
	Expense	**Capital**	**Other deferred**	**Total**
January	$ 20,270,196	$ 666,238	$ 1,643,792	$ 22,580,226
February	21,011,865	573,030	2,075,164	23,660,058
March	20,712,298	598,680	1,886,889	23,197,868
April	20,105,431	632,877	2,711,056	23,449,363
May	18,063,777	507,218	2,011,345	20,582,340
June	18,360,616	530,389	1,888,520	20,779,525
July	17,247,203	545,531	1,828,594	19,621,328
August	19,035,636	759,985	1,538,208	21,333,829
September	19,166,432	552,726	2,704,783	22,423,940
October	19,961,743	639,734	1,979,535	22,581,012
November	18,802,241	531,124	1,921,048	21,254,414
December	14,102,084	459,202	1,222,003	15,783,289
Total	**$ 226,839,523**	**$ 6,996,734**	**$ 23,410,934**	**$ 257,247,191**

A See 12ME DEC 2016 tab for department detail, by month.
B See 12ME DEC 2017 tab for department detail, by month.
C See 12ME DEC 2018 tab for department detail, by month.
D See 9ME SEP 2019 tab for department detail, by month.
E See 2019 (Budget) tab for department detail, by month.
F See 2020 (Budget) tab for department detail, by month.

Budget - 2020 **See second query for department detail**

Business Unit Hierarchy **Duke Energy Kentucky Electric**

	ASSET - Assets	CAPITAL - Capital	O&M and Other Expenses	Grand Total
Q1 2020				
Jan 2020	$ 3,161,943.84	$ 14,344,871.74	$ 38,648,515.26	$ 56,155,330.84
Feb 2020	2,995,402.87	3,620,937.46	24,840,208.61	31,456,548.94
Mar 2020	3,078,804.96	3,736,106.00	25,757,771.25	32,572,682.20
Q2 2020				
Apr 2020	3,007,531.58	3,797,105.02	25,584,568.61	32,389,205.21
May 2020	3,024,716.48	3,819,757.55	25,628,762.96	32,473,236.99
Jun 2020	3,023,115.65	3,876,347.27	25,557,211.49	32,456,674.41
Q3 2020				
Jul 2020	3,042,744.17	3,761,312.27	25,591,823.73	32,395,880.17
Aug 2020	3,120,839.02	3,721,686.67	25,712,565.08	32,555,090.77
Sep 2020	3,024,293.98	3,693,295.38	26,197,945.29	32,915,534.65
Q4 2020				
Oct 2020	3,027,472.68	3,725,545.59	26,373,064.83	33,126,083.10
Nov 2020	3,009,900.07	3,707,010.20	26,441,126.93	33,158,037.20
Dec 2020	3,026,945.05	3,853,135.23	28,030,477.80	34,910,558.08
Grand Total	**$ 36,543,710.33**	**$ 55,657,110.39**	**$ 324,364,041.84**	**$ 416,564,862.56**

Business Unit Hierarchy **Duke Energy Kentucky Electric**

	ASSET - Assets	CAPITAL - Capital	O&M and Other Expenses	Grand Total
Q1 2020				
Jan 2020				
Administrative Services	$ 41,350.00	$ 1,648.02	$ 762,146.05	$ 805,144.07
Business Transformation&Techn	258,256.28	14,124,578.54	21,776,541.31	36,159,376.12
Chairman & CEO			542,230.27	542,230.27
Corporate Accounts			(96,986.80)	(96,986.80)
Cust & Delivery Ops	2,587,448.36	16,646.92	1,247,157.29	3,851,252.58
Energy Solutions		15,241.50	1,686,673.62	1,701,915.12
Enterprise Security	17,429.38	131,743.23	1,883,035.33	2,032,207.94
Ext Affrs & Strtgc Policy			931,823.75	931,823.75
FINANCE		37,033.34	1,998,171.07	2,035,204.41
GENERAL COUNSEL			1,290,429.43	1,290,429.43
HR			2,041,548.80	2,041,548.80
REGULATED GENERATION	257,459.82	17,980.19	4,585,745.15	4,861,185.16
Feb 2020				
Administrative Services	41,350.00	1,648.02	740,287.22	783,285.24
Business Transformation&Techn	92,850.74	3,400,644.26	8,205,384.96	11,698,879.96
Chairman & CEO			542,230.27	542,230.27
Corporate Accounts			(96,986.80)	(96,986.80)
Cust & Delivery Ops	2,587,448.36	16,646.92	1,187,713.70	3,791,808.98
Energy Solutions		15,241.50	1,639,106.97	1,654,348.48
Enterprise Security	17,429.38	131,743.23	1,883,035.33	2,032,207.94
Ext Affrs & Strtgc Policy			916,998.75	916,998.75
FINANCE		37,033.34	1,998,171.07	2,035,204.41
GENERAL COUNSEL			1,238,225.23	1,238,225.23
HR			2,041,548.48	2,041,548.48
REGULATED GENERATION	256,324.39	17,980.19	4,544,493.43	4,818,798.01
Mar 2020				
Administrative Services	42,797.25	1,705.70	809,809.91	854,312.86
Business Transformation&Techn	96,667.76	3,509,863.79	8,527,962.31	12,134,493.86
Chairman & CEO			577,689.17	577,689.17
Corporate Accounts			(96,986.80)	(96,986.80)
Cust & Delivery Ops	2,587,951.55	16,646.92	1,238,540.63	3,843,139.10
Energy Solutions		15,774.96	1,569,927.10	1,585,702.05
Enterprise Security	18,350.94	135,175.62	1,977,339.85	2,130,866.41
Ext Affrs & Strtgc Policy			949,716.61	949,716.61

FINANCE		38,329.51	2,098,850.65	2,137,180.16
GENERAL COUNSEL			1,333,770.52	1,333,770.52
HR			2,100,558.59	2,100,558.59
REGULATED GENERATION	333,037.46	18,609.50	4,670,592.71	5,022,239.66
Q2 2020				
Apr 2020				
Administrative Services	42,797.25	1,705.70	772,607.04	817,110.00
Business Transformation&Techn	97,266.92	3,572,157.81	8,576,885.84	12,246,310.57
Chairman & CEO			577,689.17	577,689.17
Corporate Accounts			(96,986.80)	(96,986.80)
Cust & Delivery Ops	2,587,951.55	16,646.92	1,229,283.93	3,833,882.40
Energy Solutions		15,774.96	1,567,308.94	1,583,083.89
Enterprise Security	17,975.65	133,880.63	1,942,382.03	2,094,238.31
Ext Affrs & Strtgc Policy			949,716.61	949,716.61
FINANCE		38,329.51	2,098,850.65	2,137,180.16
GENERAL COUNSEL			1,279,850.77	1,279,850.77
HR			2,100,558.59	2,100,558.59
REGULATED GENERATION	261,540.21	18,609.50	4,586,421.83	4,866,571.53
May 2020				
Administrative Services	42,797.25	1,705.70	772,607.04	817,110.00
Business Transformation&Techn	96,961.57	3,594,810.34	8,585,895.95	12,277,667.86
Chairman & CEO			577,689.17	577,689.17
Corporate Accounts			(96,986.80)	(96,986.80)
Cust & Delivery Ops	2,587,951.55	16,646.92	1,229,283.93	3,833,882.40
Energy Solutions		15,774.96	1,589,305.26	1,605,080.22
Enterprise Security	17,975.65	133,880.63	1,942,382.03	2,094,238.31
Ext Affrs & Strtgc Policy			949,716.61	949,716.61
FINANCE		38,329.51	2,098,850.65	2,137,180.16
GENERAL COUNSEL			1,282,504.61	1,282,504.61
HR			2,100,558.59	2,100,558.59
REGULATED GENERATION	279,030.46	18,609.50	4,596,955.91	4,894,595.86
Jun 2020				
Administrative Services	42,797.25	1,705.70	794,207.04	838,710.00
Business Transformation&Techn	95,384.09	3,651,400.06	8,435,107.93	12,181,892.08
Chairman & CEO			577,689.17	577,689.17
Corporate Accounts			(96,986.80)	(96,986.80)
Cust & Delivery Ops	2,587,951.55	16,646.92	1,229,283.93	3,833,882.40
Energy Solutions		15,774.96	1,656,179.62	1,671,954.57
Enterprise Security	17,975.65	133,880.63	1,942,382.03	2,094,238.31
Ext Affrs & Strtgc Policy			949,716.61	949,716.61
FINANCE		38,329.51	2,098,850.65	2,137,180.16
GENERAL COUNSEL			1,279,850.77	1,279,850.77
HR			2,100,558.59	2,100,558.59
REGULATED GENERATION	279,007.11	18,609.50	4,590,371.94	4,887,988.55
Q3 2020				
Jul 2020				
Administrative Services	42,797.25	1,705.70	815,018.27	859,521.22
Business Transformation&Techn	97,212.61	3,536,365.06	8,563,970.10	12,197,547.77
Chairman & CEO			577,689.17	577,689.17
Corporate Accounts			(96,986.80)	(96,986.80)
Cust & Delivery Ops	2,587,951.55	16,646.92	1,283,489.41	3,888,087.88
Energy Solutions		15,774.96	1,458,374.75	1,474,149.70
Enterprise Security	17,975.65	133,880.63	1,942,382.03	2,094,238.31
Ext Affrs & Strtgc Policy			965,060.48	965,060.48
FINANCE		38,329.51	2,098,850.65	2,137,180.16
GENERAL COUNSEL			1,333,770.52	1,333,770.52
HR			2,100,558.59	2,100,558.59
REGULATED GENERATION	296,807.11	18,609.50	4,549,646.55	4,865,063.16
Aug 2020				
Administrative Services	42,797.25	1,705.70	794,207.04	838,710.00
Business Transformation&Techn	97,825.45	3,495,444.47	8,614,393.81	12,207,663.73
Chairman & CEO			577,689.17	577,689.17
Corporate Accounts			(96,986.80)	(96,986.80)
Cust & Delivery Ops	2,587,951.55	16,646.92	1,244,965.70	3,849,564.17
Energy Solutions		15,774.96	1,566,950.32	1,582,725.27
Enterprise Security	18,350.94	135,175.62	1,977,339.85	2,130,866.41

Ext Affrs & Strtgc Policy			949,716.61	949,716.61
FINANCE		38,329.51	2,098,850.65	2,137,180.16
GENERAL COUNSEL			1,279,850.77	1,279,850.77
HR			2,100,558.59	2,100,558.59
REGULATED GENERATION	373,913.83	18,609.50	4,605,029.35	4,997,552.67
Sep 2020				
Administrative Services	42,797.25	1,705.70	811,218.77	855,721.72
Business Transformation&Techn	96,755.43	3,468,348.17	8,540,115.24	12,105,218.84
Chairman & CEO			577,689.17	577,689.17
Corporate Accounts			(96,986.80)	(96,986.80)
Cust & Delivery Ops	2,587,951.55	16,646.92	1,229,283.93	3,833,882.40
Energy Solutions		15,774.96	2,218,367.36	2,234,142.31
Enterprise Security	17,975.65	133,880.63	1,942,382.03	2,094,238.31
Ext Affrs & Strtgc Policy			949,716.61	949,716.61
FINANCE		38,329.51	2,098,850.65	2,137,180.16
GENERAL COUNSEL			1,282,504.61	1,282,504.61
HR			2,100,558.59	2,100,558.59
REGULATED GENERATION	278,814.10	18,609.50	4,544,245.13	4,841,668.72
Q4 2020				
Oct 2020				
Administrative Services	42,797.25	1,705.70	772,607.04	817,110.00
Business Transformation&Techn	99,934.13	3,500,598.38	8,802,312.87	12,402,845.38
Chairman & CEO			577,689.17	577,689.17
Corporate Accounts			(96,986.80)	(96,986.80)
Cust & Delivery Ops	2,587,951.55	16,646.92	1,229,283.93	3,833,882.40
Energy Solutions		15,774.96	2,173,489.33	2,189,264.28
Enterprise Security	17,975.65	133,880.63	1,942,382.03	2,094,238.31
Ext Affrs & Strtgc Policy			949,716.61	949,716.61
FINANCE		38,329.51	2,098,850.65	2,137,180.16
GENERAL COUNSEL			1,279,850.77	1,279,850.77
HR			2,100,558.59	2,100,558.59
REGULATED GENERATION	278,814.10	18,609.50	4,543,310.63	4,840,734.22
Nov 2020				
Administrative Services	42,797.25	1,705.70	772,607.04	817,110.00
Business Transformation&Techn	100,179.29	3,482,062.98	8,822,693.52	12,404,935.79
Chairman & CEO			577,689.17	577,689.17
Corporate Accounts			(96,986.80)	(96,986.80)
Cust & Delivery Ops	2,587,951.55	16,646.92	1,229,283.93	3,833,882.40
Energy Solutions		15,774.96	2,215,387.10	2,231,162.05
Enterprise Security	17,975.65	133,880.63	1,942,382.03	2,094,238.31
Ext Affrs & Strtgc Policy			949,716.61	949,716.61
FINANCE		38,329.51	2,098,850.65	2,137,180.16
GENERAL COUNSEL			1,279,850.77	1,279,850.77
HR			2,100,558.59	2,100,558.59
REGULATED GENERATION	260,996.33	18,609.50	4,549,094.32	4,828,700.14
Dec 2020				
Administrative Services	42,797.25	1,705.70	793,418.23	837,921.18
Business Transformation&Techn	117,247.63	3,628,188.01	10,221,711.12	13,967,146.76
Chairman & CEO			577,689.17	577,689.17
Corporate Accounts			(96,986.80)	(96,986.80)
Cust & Delivery Ops	2,587,951.55	16,646.92	1,283,500.41	3,888,098.88
Energy Solutions		15,774.96	2,265,502.34	2,281,277.30
Enterprise Security	17,975.65	133,880.63	1,942,382.03	2,094,238.31
Ext Affrs & Strtgc Policy			965,060.48	965,060.48
FINANCE		38,329.51	2,098,845.65	2,137,175.16
GENERAL COUNSEL			1,333,770.52	1,333,770.52
HR			2,100,558.59	2,100,558.59
REGULATED GENERATION	260,972.97	18,609.50	4,545,026.06	4,824,608.52
Grand Total	$ 36,543,710.33	$ 55,657,110.39	$ 324,364,041.84	$ 416,564,862.56

Budget - 2019

See second query for department detail

Business Unit Hierarchy **Duke Energy Kentucky Electric**

	ASSET - Assets	CAPITAL - Capital	O&M and Other Expenses	Grand Total
Q1 2019				
Jan 2019	$ 2,905,013.03	$ 4,128,670.25	$ 25,732,094.86	$ 32,765,778.14
Feb 2019	2,848,260.10	4,157,318.07	25,364,630.78	32,370,208.96
Mar 2019	3,802,119.38	4,462,627.43	26,933,488.57	35,198,235.38
Q2 2019				
Apr 2019	2,890,525.22	4,315,537.52	25,991,289.77	33,197,352.51
May 2019	2,895,728.59	4,345,255.05	25,949,048.38	33,190,032.03
Jun 2019	2,895,745.76	4,318,046.61	26,324,056.35	33,537,848.73
Q3 2019				
Jul 2019	2,895,846.49	4,284,700.28	26,246,639.07	33,427,185.84
Aug 2019	3,821,706.40	4,480,260.76	26,813,642.46	35,115,609.62
Sep 2019	2,895,671.16	4,276,534.66	26,256,649.08	33,428,854.90
Q4 2019				
Oct 2019	2,918,054.90	4,358,683.52	26,392,745.90	33,669,484.32
Nov 2019	2,918,508.85	4,326,625.32	26,351,989.18	33,597,123.35
Dec 2019	2,930,634.55	4,313,383.43	26,647,396.90	33,891,414.88
Grand Total	**$ 36,617,814.41**	**$ 51,767,642.95**	**$ 315,003,671.30**	**$ 403,389,128.66**

Business Unit Hierarchy **Duke Energy Kentucky Electric**

	ASSET - Assets	CAPITAL - Capital	O&M and Other Expenses	Grand Total
Q1 2019				
Jan 2019				
Administrative Services	$ 39,952.00	$ 1,592.29	$ 707,520.91	$ 749,065.20
Business Transformation&Techn	104,060.47	3,904,757.54	9,464,552.04	13,473,370.06
Chairman & CEO			493,443.37	493,443.37
Corporate Accounts			11,730.61	11,730.61
Cust & Delivery Ops	2,467,070.16	16,175.15	1,547,576.45	4,030,821.76
Energy Solutions		23,115.95	1,557,704.40	1,580,820.36
Enterprise Security	17,429.38	131,743.23	1,883,035.33	2,032,207.94
Ext Affrs & Strtgc Policy			887,011.55	887,011.55
FINANCE		33,305.89	2,453,703.86	2,487,009.76
GENERAL COUNSEL			1,210,719.40	1,210,719.40
HR			1,871,071.92	1,871,071.92
Natural Gas Operations			7,611.12	7,611.12
REGULATED GENERATION	276,501.02	17,980.19	3,636,413.90	3,930,895.11
Feb 2019				
Administrative Services	39,952.00	1,592.29	703,925.88	745,470.17
Business Transformation&Techn	103,826.45	3,933,405.36	9,262,324.18	13,299,555.99
Chairman & CEO			493,443.37	493,443.37
Corporate Accounts			11,730.61	11,730.61
Cust & Delivery Ops	2,411,686.68	16,175.15	1,537,685.11	3,965,546.95
Energy Solutions		23,115.95	1,455,733.88	1,478,849.84
Enterprise Security	17,429.38	131,743.23	1,883,035.33	2,032,207.94
Ext Affrs & Strtgc Policy			887,011.55	887,011.55
FINANCE		33,305.89	2,460,578.86	2,493,884.76
GENERAL COUNSEL			1,210,719.40	1,210,719.40
HR			1,855,093.08	1,855,093.08
Natural Gas Operations			7,611.12	7,611.12

REGULATED GENERATION	275,365.59	17,980.19	3,595,738.41	3,889,084.19
Mar 2019				
Administrative Services	41,350.00	1,648.02	797,248.55	840,246.58
Business Transformation&Techn	111,958.52	4,232,056.33	9,894,579.75	14,238,594.61
Chairman & CEO			542,230.27	542,230.27
Corporate Accounts			11,730.61	11,730.61
Cust & Delivery Ops	3,268,955.66	16,741.22	1,657,614.07	4,943,310.95
Energy Solutions		23,925.00	1,472,827.21	1,496,752.21
Enterprise Security	18,350.94	135,175.62	1,977,339.85	2,130,866.41
Ext Affrs & Strtgc Policy			933,447.95	933,447.95
FINANCE		34,471.74	2,560,156.80	2,594,628.54
GENERAL COUNSEL			1,310,738.15	1,310,738.15
HR			1,994,644.54	1,994,644.54
Natural Gas Operations			7,877.50	7,877.50
REGULATED GENERATION	361,504.26	18,609.50	3,773,053.31	4,153,167.06
Q2 2019				
Apr 2019				
Administrative Services	41,350.00	1,648.02	735,340.14	778,338.16
Business Transformation&Techn	105,871.40	4,086,261.41	9,308,187.10	13,500,319.92
Chairman & CEO			542,230.27	542,230.27
Corporate Accounts			11,730.61	11,730.61
Cust & Delivery Ops	2,444,746.77	16,741.22	1,591,007.77	4,052,495.76
Energy Solutions		23,925.00	1,458,609.32	1,482,534.32
Enterprise Security	17,975.65	133,880.63	1,942,382.03	2,094,238.31
Ext Affrs & Strtgc Policy			918,622.95	918,622.95
FINANCE		34,471.74	2,557,259.75	2,591,731.49
GENERAL COUNSEL			1,253,340.15	1,253,340.15
HR			1,994,644.54	1,994,644.54
Natural Gas Operations			7,877.50	7,877.50
REGULATED GENERATION	280,581.41	18,609.50	3,670,057.62	3,969,248.52
May 2019				
Administrative Services	41,350.00	1,648.02	735,340.14	778,338.16
Business Transformation&Techn	105,357.60	4,115,978.95	9,263,768.90	13,485,105.45
Chairman & CEO			542,230.27	542,230.27
Corporate Accounts			11,730.61	11,730.61
Cust & Delivery Ops	2,450,803.68	16,741.22	1,591,007.77	4,058,552.68
Energy Solutions		23,925.00	1,515,297.25	1,539,222.25
Enterprise Security	17,975.65	133,880.63	1,942,382.03	2,094,238.31
Ext Affrs & Strtgc Policy			918,622.95	918,622.95
FINANCE		34,471.74	2,557,259.75	2,591,731.49
GENERAL COUNSEL			1,255,993.15	1,255,993.15
HR			1,994,644.54	1,994,644.54
Natural Gas Operations			7,877.50	7,877.50
REGULATED GENERATION	280,241.66	18,609.50	3,612,893.51	3,911,744.66
Jun 2019				
Administrative Services	41,350.00	1,648.02	756,940.14	799,938.16
Business Transformation&Techn	105,398.12	4,088,770.51	9,257,222.98	13,451,391.60
Chairman & CEO			542,230.27	542,230.27
Corporate Accounts			11,730.61	11,730.61
Cust & Delivery Ops	2,450,803.68	16,741.22	1,591,007.77	4,058,552.68
Energy Solutions		23,925.00	1,884,488.11	1,908,413.11
Enterprise Security	17,975.65	133,880.63	1,942,382.03	2,094,238.31
Ext Affrs & Strtgc Policy			918,622.95	918,622.95
FINANCE		34,471.74	2,557,259.75	2,591,731.49
GENERAL COUNSEL			1,253,340.15	1,253,340.15
HR			1,994,644.54	1,994,644.54
Natural Gas Operations			7,877.50	7,877.50
REGULATED GENERATION	280,218.31	18,609.50	3,606,309.54	3,905,137.35

Q3 2019				
Jul 2019				
Administrative Services	41,350.00	1,648.02	756,940.14	799,938.16
Business Transformation&Techn	105,498.85	4,055,424.18	9,264,004.68	13,424,927.71
Chairman & CEO			542,230.27	542,230.27
Corporate Accounts			11,730.61	11,730.61
Cust & Delivery Ops	2,450,803.68	16,741.22	1,591,007.77	4,058,552.68
Energy Solutions		23,925.00	1,839,207.81	1,863,132.81
Enterprise Security	17,975.65	133,880.63	1,942,382.03	2,094,238.31
Ext Affrs & Strtgc Policy			918,622.95	918,622.95
FINANCE		34,471.74	2,557,259.75	2,591,731.49
GENERAL COUNSEL			1,253,340.15	1,253,340.15
HR			1,994,644.54	1,994,644.54
Natural Gas Operations			7,877.50	7,877.50
REGULATED GENERATION	280,218.31	18,609.50	3,567,390.85	3,866,218.66
Aug 2019				
Administrative Services	41,350.00	1,648.02	775,917.03	818,915.05
Business Transformation&Techn	109,856.34	4,249,689.66	9,621,982.17	13,981,528.17
Chairman & CEO			542,230.27	542,230.27
Corporate Accounts			11,730.61	11,730.61
Cust & Delivery Ops	3,285,398.49	16,741.22	1,658,801.03	4,960,940.74
Energy Solutions		23,925.00	1,843,038.97	1,866,963.97
Enterprise Security	18,350.94	135,175.62	1,977,339.85	2,130,866.41
Ext Affrs & Strtgc Policy			933,447.95	933,447.95
FINANCE		34,471.74	2,570,240.14	2,604,711.88
GENERAL COUNSEL			1,253,340.15	1,253,340.15
HR			1,994,644.54	1,994,644.54
Natural Gas Operations			7,877.50	7,877.50
REGULATED GENERATION	366,750.63	18,609.50	3,623,052.26	4,008,412.38
Sep 2019				
Administrative Services	41,350.00	1,648.02	778,456.24	821,454.26
Business Transformation&Techn	105,516.53	4,047,258.55	9,265,120.94	13,417,896.03
Chairman & CEO			542,230.27	542,230.27
Corporate Accounts			11,730.61	11,730.61
Cust & Delivery Ops	2,450,803.68	16,741.22	1,591,007.77	4,058,552.68
Energy Solutions		23,925.00	1,763,659.25	1,787,584.25
Enterprise Security	17,975.65	133,880.63	1,942,382.03	2,094,238.31
Ext Affrs & Strtgc Policy			918,622.95	918,622.95
FINANCE		34,471.74	2,567,343.09	2,601,814.83
GENERAL COUNSEL			1,313,391.15	1,313,391.15
HR			1,994,644.54	1,994,644.54
Natural Gas Operations			7,877.50	7,877.50
REGULATED GENERATION	280,025.30	18,609.50	3,560,182.72	3,858,817.52
Q4 2019				
Administrative Services	124,050.00	4,944.07	2,206,020.38	2,335,014.44
Business Transformation&Techn	324,619.90	12,310,863.95	28,745,388.16	41,380,872.02
Chairman & CEO			1,626,690.81	1,626,690.81
Corporate Accounts			35,191.84	35,191.84
Cust & Delivery Ops	7,422,827.84	50,223.66	4,773,034.32	12,246,085.82
Energy Solutions		71,775.00	5,267,350.89	5,339,125.89
Enterprise Security	53,926.95	401,641.89	5,827,146.09	6,282,714.93
Ext Affrs & Strtgc Policy			2,755,868.85	2,755,868.85
FINANCE		103,415.21	7,702,029.26	7,805,444.48
GENERAL COUNSEL			3,760,020.46	3,760,020.46
HR			5,984,514.63	5,984,514.63
Natural Gas Operations			23,632.50	23,632.50
REGULATED GENERATION	841,773.61	55,828.49	10,685,243.80	11,582,845.90
Grand Total	**$ 36,617,814.41**	**$ 51,767,642.95**	**$ 315,003,671.30**	**$ 403,389,128.66**

Actual - 9 months ending September 2019 **See second query for department detail**

Business Unit Hierarchy **Duke Energy Kentucky Electric**

	ASSET - Assets	CAPITAL - Capital	INDIRECT - Indirect	O&M and Other Expenses	Grand Total
Q1 2019					
Jan 2019	$ 1,760,133.64	$ 1,045,255.03		$ 20,738,790.03	$ 23,544,178.70
Feb 2019	4,088,687.35	2,186,236.40		43,359,489.73	49,634,413.48
Mar 2019	7,199,008.06	3,461,593.14		66,377,105.95	77,037,707.15
Q2 2019					
Apr 2019	9,363,382.90	4,823,559.31		88,445,012.35	102,631,954.56
May 2019	11,681,528.44	6,313,097.27		109,469,792.15	127,464,417.86
Jun 2019	12,845,739.02	8,121,271.49		131,820,786.72	152,787,797.23
Q3 2019					
Jul 2019	14,899,819.13	9,270,085.94		150,754,765.52	174,924,670.59
Aug 2019	18,009,846.55	11,496,723.67		171,717,880.44	201,224,450.66
Sep 2019	20,086,612.52	12,881,979.94	2,009.72	190,636,002.43	223,606,604.61
Grand Total	**$ 21,257,033.11**	**$ 14,604,718.52**	**$ 3,067.64**	**$201,320,312.32**	**$237,185,131.59**

Business Unit Hierarchy **Duke Energy Kentucky Electric**

	ASSET - Assets	CAPITAL - Capital	INDIRECT - Indirect	O&M and Other Expenses	Grand Total
Q1 2019					
Jan 2019					
100 Org Effectiveness				$ 10,960.91	$ 10,960.91
110 Central Progs Srvcs				501,183.40	501,183.40
110 Regional Srvcs				64,915.14	64,915.14
Corporate Governance DiscOps	233.17	5,834.92		(247,603.83)	(241,535.74)
DEC Central Programs Services				29,843.93	29,843.93
DEC Customer	10,662.34	3,985.11		29,275.01	43,922.46

DEC Customer Experience	117.15	1,616.92	19,176.04	20,910.11
DEC Environmental			12,589.12	12,589.12
DEC Fossil Hydro			1,516.53	1,516.53
DEC Nuclear	1,083.75		24,573.13	25,656.88
DEC Org Effectiveness		4,045.68		4,045.68
DEC Other			2,782.00	2,782.00
DEC Other Misc	33.46	5,509.24	2,765.27	8,307.97
DEC Power Delivery	10,985.90	3,865.71	169,739.67	184,591.28
DEC Regional Srvcs			8,309.08	8,309.08
DEC Whlsale Pwr & Rnwable Gen	30.92	3,833.88	2,554.96	6,419.76
DEF Other	561.68	558.65	46,049.41	47,169.74
DEF Power Delivery	419.93	0.02	25,038.14	25,458.09
DEF Regional Srvcs			7,234.02	7,234.02
DEF Retail			(3,360.00)	(3,360.00)
DEI Power Delivery	574.00		(156,124.63)	(155,550.63)
DEI President and Staff			868.16	868.16
DEP Central Progs Srvcs			5,541.03	5,541.03
DEP Fossil Hydro			32,030.57	32,030.57
DEP Power Delivery	67.34	2,409.49	72,169.75	74,646.58
DEP Regional Srvcs			1,364.15	1,364.15
DEP Retail			4,995.22	4,995.22
Duke Energy Ohio - RU		(0.01)	(99,506.27)	(99,506.28)
Marketing & Customer Engagemen		(0.02)	3,796.43	3,796.41
Piedmont Gas - Delivery	25.58	1,425.41	10,446.83	11,897.82
Piedmont Gas - Other	22.35		1,941.84	1,964.19
SrvCo Construct & Proj Mgmt	16.09	13,766.68	85,654.80	99,437.57
Srvco Customer Service	82.46	(0.07)	1,186,658.01	1,186,740.40
SrvCo Enterprise Business Svs	133,271.07	980,145.35	14,517,815.55	15,631,231.97
SrvCo EnviroHealthSafety	2,179.69	2,050.08	848,820.35	853,050.12
SrvCo Fossil Hydro Total			28,939.31	28,939.31
SrvCo Gas	22.99		2,764.52	2,787.51
SrvCo Gen Support	156,760.96	2,167.05	375,662.21	534,590.22
SrvCo Nuclear			6,413.95	6,413.95

SrvCo Other	2,634.21	11,571.87	1,701,899.32	1,716,105.40
SrvCo Power Delivery	1,440,348.60	2,469.07	1,399,097.00	2,841,914.67
Feb 2019				
100 Org Effectiveness			32,293.53	32,293.53
110 Central Progs Srvcs			1,028,027.11	1,028,027.11
110 Regional Srvcs			127,670.18	127,670.18
Corporate Governance DiscOps	462.32	9,340.31	(427,306.31)	(417,503.68)
DEC Central Programs Services			64,462.08	64,462.08
DEC Customer	22,558.34	10,767.92	161,974.91	195,301.17
DEC Customer Experience	239.88	1,972.56	35,286.34	37,498.78
DEC Environmental			25,452.84	25,452.84
DEC Fossil Hydro	9.06		20,350.06	20,359.12
DEC Nuclear	1,358.34		46,434.55	47,792.89
DEC Org Effectiveness		8,198.34	(5,132.60)	3,065.74
DEC Other			6,634.00	6,634.00
DEC Other Misc	63.66	13,091.16	5,260.76	18,415.58
DEC Power Delivery	18,398.20	9,442.61	403,029.26	430,870.07
DEC Regional Srvcs			16,314.02	16,314.02
DEC Whlsale Pwr & Rnwable Gen	32.59	3,971.76	2,692.84	6,697.19
DEF Other	1,601.75	579.88	131,301.47	133,483.10
DEF Power Delivery	453.72	44.63	69,467.17	69,965.52
DEF Regional Srvcs			15,914.94	15,914.94
DEF Retail		-	(740.97)	(740.97)
DEI Power Delivery	574.00		(149,311.34)	(148,737.34)
DEI President and Staff			2,960.58	2,960.58
DEP Central Progs Srvcs			11,377.09	11,377.09
DEP Environmental			(4,000.00)	(4,000.00)
DEP Fossil Hydro			58,278.72	58,278.72
DEP Power Delivery	77.45	6,177.33	131,315.65	137,570.43
DEP Regional Srvcs			3,221.75	3,221.75
DEP Retail		-	28,950.04	28,950.04
Duke Energy Ohio - RU		-	(89,763.59)	(89,763.59)
Marketing & Customer Engagemen		(0.03)	3,796.43	3,796.40

Piedmont Gas - Customer			467.49	467.49
Piedmont Gas - Delivery	59.56	15,766.91	16,761.83	32,588.30
Piedmont Gas - Other	46.52		3,939.42	3,985.94
SrvCo Construct & Proj Mgmt	16.74	22,152.34	203,155.89	225,324.97
Srvco Customer Service	82.46	3.32	2,465,693.41	2,465,779.19
SrvCo Enterprise Business Svs	276,175.33	2,044,729.63	30,064,378.05	32,385,283.01
SrvCo EnviroHealthSafety	9,582.83	3,860.61	1,762,559.83	1,776,003.27
SrvCo Fossil Hydro Total			66,239.85	66,239.85
SrvCo Gas	22.99		3,079.27	3,102.26
SrvCo Gen Support	319,871.73	6,220.25	755,303.87	1,081,395.85
SrvCo Nuclear			12,986.37	12,986.37
SrvCo Other	7,162.48	26,430.92	3,486,962.83	3,520,556.23
SrvCo Power Delivery	3,429,837.40	3,485.95	2,761,750.11	6,195,073.46
Mar 2019				
100 Org Effectiveness			46,043.82	46,043.82
110 Central Progs Srvcs			1,548,307.59	1,548,307.59
110 Regional Srvcs			182,194.35	182,194.35
Corporate Governance DiscOps	593.53	13,017.86	(752,512.18)	(738,900.79)
DE Renewables & Transmission	25.85		2,136.46	2,162.31
DEC Central Programs Services			101,224.48	101,224.48
DEC Customer	34,747.53	28,592.41	234,764.36	298,104.30
DEC Customer Experience	2,783.57	5,319.18	51,390.40	59,493.15
DEC Environmental			38,793.81	38,793.81
DEC Fossil Hydro	9.06		43,663.69	43,672.75
DEC Nuclear	3,269.76		42,238.27	45,508.03
DEC Org Effectiveness		13,214.74	(5,132.60)	8,082.14
DEC Other			13,103.90	13,103.90
DEC Other Misc	83.15	20,176.65	6,947.11	27,206.91
DEC Power Delivery	26,137.83	17,155.47	637,344.21	680,637.51
DEC Regional Srvcs			29,187.77	29,187.77
DEC Whlsale Pwr & Rnwable Gen	36.02	4,255.04	2,976.12	7,267.18
DEF Other	2,976.38	912.24	243,975.75	247,864.37
DEF Power Delivery	509.16	1,860.25	93,939.91	96,309.32

DEF Regional Srvcs			24,834.60	24,834.60
DEF Retail		-	(1,397.37)	(1,397.37)
DEI Power Delivery	574.00		(147,332.55)	(146,758.55)
DEI President and Staff			6,023.69	6,023.69
DEP Central Progs Srvcs			17,065.54	17,065.54
DEP Environmental			(4,000.00)	(4,000.00)
DEP Fossil Hydro	2.64		90,103.30	90,105.94
DEP Org Effectiveness	49.64	5,000.58	4,102.62	9,152.84
DEP Power Delivery	116.13	8,603.19	205,641.14	214,360.46
DEP Regional Srvcs			9,964.78	9,964.78
DEP Retail		(0.07)	31,662.80	31,662.73
Duke Energy Ohio - RU		0.01	(80,741.24)	(80,741.23)
Marketing & Customer Engagemen		(0.04)	3,796.43	3,796.39
Piedmont Gas - Customer			578.97	578.97
Piedmont Gas - Delivery	117.48	23,878.91	36,047.49	60,043.88
Piedmont Gas - Other	80.45		6,743.04	6,823.49
SrvCo Construct & Proj Mgmt	16.74	26,203.29	316,509.17	342,729.20
Srvco Customer Service	82.46	1,827.16	4,134,976.02	4,136,885.64
SrvCo Enterprise Business Svs	423,111.88	3,232,866.59	45,686,479.04	49,342,457.51
SrvCo EnviroHealthSafety	15,214.21	5,097.45	2,668,063.89	2,688,375.55
SrvCo Fossil Hydro Total	126.42		105,720.13	105,846.55
SrvCo Gas	22.99		3,872.28	3,895.27
SrvCo Gen Support	433,403.74	9,125.45	1,102,989.02	1,545,518.21
SrvCo Nuclear			19,831.17	19,831.17
SrvCo Other	12,096.03	41,970.71	5,308,414.48	5,362,481.22
SrvCo Power Delivery	6,242,821.41	2,516.07	4,266,570.29	10,511,907.77
Q2 2019				
Apr 2019				
100 Org Effectiveness			57,742.05	57,742.05
110 Central Progs Srvcs		3,451.21	1,990,910.56	1,994,361.77
110 Regional Srvcs			222,221.62	222,221.62
Corporate Governance DiscOps	800.75	16,935.20	421,231.98	438,967.93
DE Renewables & Transmission	25.85		2,136.46	2,162.31

DEC Central Programs Services			140,532.85	140,532.85
DEC Customer	45,525.15	57,086.10	289,999.80	392,611.05
DEC Customer Experience	4,796.57	12,958.42	51,952.59	69,707.58
DEC Environmental			54,076.45	54,076.45
DEC Fleet Maint Srvcs			54,320.02	54,320.02
DEC Fossil Hydro	9.06		50,949.85	50,958.91
DEC Nuclear	3,146.73		50,472.26	53,618.99
DEC Org Effectiveness		17,753.46	(5,132.60)	12,620.86
DEC Other			17,329.50	17,329.50
DEC Other Misc	100.10	26,638.31	8,630.12	35,368.53
DEC Power Delivery	32,032.11	26,074.68	868,291.13	926,397.92
DEC Rates			3,870.21	3,870.21
DEC Regional Srvcs			32,251.52	32,251.52
DEC Whlsale Pwr & Rnwable Gen	38.79	4,484.32	3,205.40	7,728.51
DEF Fossil Hydro			968.31	968.31
DEF Other	3,775.82	912.24	309,503.26	314,191.32
DEF Power Delivery	523.75	4,594.23	117,297.93	122,415.91
DEF Regional Srvcs			33,754.26	33,754.26
DEF Retail		-	1,478.44	1,478.44
DEI Power Delivery	574.00		(140,479.83)	(139,905.83)
DEI President and Staff			8,401.42	8,401.42
DEP Central Progs Srvcs			22,783.89	22,783.89
DEP Environmental			(4,000.00)	(4,000.00)
DEP Fossil Hydro	2.64		116,341.21	116,343.85
DEP Gen Ops Support			-	-
DEP Nuclear	36.31		2,928.42	2,964.73
DEP Org Effectiveness	49.64	12,111.84	4,102.62	16,264.10
DEP Power Delivery	131.97	10,340.16	251,997.12	262,469.25
DEP Regional Srvcs			16,076.39	16,076.39
DEP Retail		(0.06)	31,754.51	31,754.45
Duke Energy Ohio - RU		0.01	(69,078.60)	(69,078.59)
Marketing & Customer Engagemen		(0.04)	5,780.75	5,780.71
Piedmont Gas - Customer			578.97	578.97

Piedmont Gas - Delivery	135.69	31,056.39	45,283.23	76,475.31
Piedmont Gas - Other	80.45	8,745.84	6,743.04	15,569.33
Srvco Coal Combustion Products			500.00	500.00
SrvCo Construct & Proj Mgmt	16.74	29,415.97	408,199.68	437,632.39
Srvco Customer Service	82.46	3,094.76	5,387,025.01	5,390,202.23
SrvCo Enterprise Business Svs	555,541.24	4,477,911.36	60,023,373.19	65,056,825.79
SrvCo EnviroHealthSafety	15,432.31	6,269.38	3,463,796.93	3,485,498.62
SrvCo Fossil Hydro Total	126.42		141,371.75	141,498.17
SrvCo Gas	22.99		3,872.28	3,895.27
SrvCo Gen Support	536,133.20	14,741.88	1,407,929.11	1,958,804.19
SrvCo Nuclear			24,722.70	24,722.70
SrvCo Other	16,720.28	53,480.41	6,891,239.04	6,961,439.73
SrvCo Power Delivery	8,147,521.88	5,503.24	5,615,775.55	13,768,800.67
May 2019				
100 Org Effectiveness			70,113.76	70,113.76
110 Central Progs Srvcs		9,778.66	2,467,377.53	2,477,156.19
110 Regional Srvcs			257,031.33	257,031.33
Corporate Governance DiscOps	960.69	19,262.04	1,599,149.64	1,619,372.37
DE Renewables & Transmission	25.85		2,136.46	2,162.31
DEC Central Programs Services		4,227.94	178,136.94	182,364.88
DEC Customer	17,381.37	84,608.02	224,102.52	326,091.91
DEC Customer Experience	6,930.65	26,611.27	50,561.89	84,103.81
DEC Environmental			66,783.63	66,783.63
DEC Fleet Maint Srvcs			54,320.02	54,320.02
DEC Fossil Hydro	9.06	1,363.70	63,005.98	64,378.74
DEC Nuclear	3,195.62	5,165.22	54,414.53	62,775.37
DEC Org Effectiveness		21,893.94	(5,132.60)	16,761.34
DEC Other			33,891.72	33,891.72
DEC Other Misc	117.05	31,624.93	10,025.41	41,767.39
DEC Power Delivery	39,242.13	36,101.58	1,020,250.25	1,095,593.96
DEC Rates			3,870.21	3,870.21
DEC Regional Srvcs			34,865.21	34,865.21
DEC Whlsale Pwr & Rnwable Gen	41.93	4,743.99	3,465.08	8,251.00

DEF Fossil Hydro	18.00		968.31	986.31
DEF Other	4,638.43	912.24	380,208.81	385,759.48
DEF Power Delivery	3,258.96	7,396.95	113,432.93	124,088.84
DEF Regional Srvcs			40,196.09	40,196.09
DEF Retail		(0.02)	4,423.10	4,423.08
DEI Power Delivery	873.60	-	(160,394.80)	(159,521.20)
DEI President and Staff			10,640.13	10,640.13
DEP Central Progs Srvcs			28,493.73	28,493.73
DEP Environmental			(4,000.00)	(4,000.00)
DEP Fossil Hydro	2.64		139,674.65	139,677.29
DEP Gen Ops Support			-	-
DEP Nuclear	152.49		12,298.39	12,450.88
DEP Org Effectiveness	49.64	18,968.22	4,102.62	23,120.48
DEP Power Delivery	135.84	13,718.96	246,186.58	260,041.38
DEP Regional Srvcs			21,981.79	21,981.79
DEP Retail		(0.06)	31,860.41	31,860.35
Duke Energy Ohio - RU		0.01	(59,200.44)	(59,200.43)
Marketing & Customer Engagemen		(0.04)	5,780.75	5,780.71
Piedmont Gas - Customer			578.97	578.97
Piedmont Gas - Delivery	151.16	37,317.85	51,412.51	88,881.52
Piedmont Gas - Other	80.45	16,005.24	6,743.04	22,828.73
Srvco Coal Combustion Products			500.00	500.00
SrvCo Construct & Proj Mgmt	16.74	33,268.85	495,408.31	528,693.90
Srvco Customer Service	107.42	7,192.80	6,607,699.53	6,614,999.75
SrvCo Enterprise Business Svs	779,521.23	5,831,951.20	73,627,378.69	80,238,851.12
SrvCo EnviroHealthSafety	18,027.52	8,927.61	4,207,603.10	4,234,558.23
SrvCo Fossil Hydro Total	126.42		185,200.00	185,326.42
SrvCo Gas	22.99		5,193.78	5,216.77
SrvCo Gen Support	648,286.95	17,617.11	1,697,452.43	2,363,356.49
SrvCo Nuclear			29,821.59	29,821.59
SrvCo Other	20,929.67	67,524.19	8,563,408.27	8,651,862.13
SrvCo Power Delivery	10,137,223.94	6,914.87	6,986,369.37	17,130,508.18
Jun 2019				

100 Org Effectiveness			100,417.80	100,417.80
110 Central Progs Srvcs		17,371.56	2,978,283.40	2,995,654.96
110 Regional Srvcs			302,333.90	302,333.90
Corporate Governance DiscOps	1,111.97	19,800.46	2,838,833.59	2,859,746.02
DE Renewables & Transmission	25.85		2,136.46	2,162.31
DEC Central Programs Services		11,446.24	121,616.23	133,062.47
DEC Customer	17,310.01	98,349.89	212,121.85	327,781.75
DEC Customer Experience	2,821.44	43,791.41	72,441.18	119,054.03
DEC Environmental			79,433.21	79,433.21
DEC Fleet Maint Srvcs			-	-
DEC Fossil Hydro	9.06	1,363.71	41,268.07	42,640.84
DEC Nuclear	3,244.81	8,572.96	59,131.81	70,949.58
DEC Org Effectiveness		27,149.14	(5,132.60)	22,016.54
DEC Other			80,119.97	80,119.97
DEC Other Misc	145.01	38,347.94	12,336.07	50,829.02
DEC Power Delivery	6,027.12	43,056.97	878,590.57	927,674.66
DEC President & Staff			10,021.58	10,021.58
DEC Rates			3,870.21	3,870.21
DEC Regional Srvcs			20,267.74	20,267.74
DEC Whlsale Pwr & Rnwable Gen	45.36	5,027.19	3,748.28	8,820.83
DEF Fossil Hydro	18.00		968.31	986.31
DEF Other	5,413.56	912.24	443,744.36	450,070.16
DEF Power Delivery	3,693.91	10,687.88	123,935.33	138,317.12
DEF Regional Srvcs		2,675.83	44,210.09	46,885.92
DEF Retail		(0.03)	29,159.37	29,159.34
DEI Power Delivery	873.60	-	(141,622.13)	(140,748.53)
DEI President and Staff			12,086.25	12,086.25
DEP Central Progs Srvcs			34,481.55	34,481.55
DEP Environmental			(4,000.00)	(4,000.00)
DEP Fossil Hydro	2.64		162,449.24	162,451.88
DEP Gen Ops Support			-	-
DEP Nuclear	47.76		3,852.51	3,900.27
DEP Org Effectiveness	49.64	25,600.52	4,102.62	29,752.78

DEP Power Delivery	173.42	15,144.86	276,244.21	291,562.49
DEP Regional Srvcs			26,880.99	26,880.99
DEP Retail		(0.07)	31,913.36	31,913.29
Duke Energy Ohio - RU		0.01	(64,558.78)	(64,558.77)
Marketing & Customer Engagemen		(0.06)	5,780.75	5,780.69
Piedmont Gas - Customer			578.97	578.97
Piedmont Gas - Delivery	179.02	43,524.83	55,473.66	99,177.51
Piedmont Gas - Other	92.68	21,686.43	7,754.02	29,533.13
Srvco Coal Combustion Products			29,250.85	29,250.85
SrvCo Construct & Proj Mgmt	16.74	37,331.45	581,892.14	619,240.33
Srvco Customer Service	168.23	17,410.06	7,834,300.80	7,851,879.09
SrvCo Enterprise Business Svs	807,656.54	7,515,432.93	87,781,288.78	96,104,378.25
SrvCo EnviroHealthSafety	20,671.35	10,558.58	4,985,691.36	5,016,921.29
SrvCo Fossil Hydro Total	126.42		215,057.08	215,183.50
SrvCo Gas	22.99		7,008.19	7,031.18
SrvCo Gen Support	119,797.32	19,714.68	2,654,712.35	2,794,224.35
SrvCo Nuclear			36,838.09	36,838.09
SrvCo Other	25,861.91	79,399.15	10,273,758.69	10,379,019.75
SrvCo Power Delivery	11,830,132.66	6,914.73	8,555,714.39	20,392,761.78
Q3 2019				
Jul 2019				
100 Org Effectiveness			115,710.59	115,710.59
110 Central Progs Srvcs		24,619.28	3,387,659.44	3,412,278.72
110 Regional Srvcs			356,703.07	356,703.07
Corporate Governance DiscOps	1,201.87	19,918.55	2,894,742.59	2,915,863.01
DE Renewables & Transmission	25.85		2,136.46	2,162.31
DEC Central Programs Services		18,462.46	156,200.45	174,662.91
DEC Customer	17,319.57	114,562.72	270,642.25	402,524.54
DEC Customer Experience	5,176.89	59,017.87	86,064.75	150,259.51
DEC Environmental			82,948.16	82,948.16
DEC Fleet Maint Srvcs			-	-
DEC Fossil Hydro	9.06	1,363.71	46,162.08	47,534.85
DEC Fossil Hydro Gen Support			502.36	502.36

DEC Nuclear	3,321.08	11,950.71	65,187.87	80,459.66
DEC Org Effectiveness		31,687.70	(3,359.78)	28,327.92
DEC Other			111,375.34	111,375.34
DEC Other Misc	163.43	43,186.04	14,352.91	57,702.38
DEC Power Delivery	(18,321.58)	52,302.07	805,491.14	839,471.63
DEC President & Staff			-	-
DEC Rates			3,870.21	3,870.21
DEC Regional Srvcs			21,253.75	21,253.75
DEC Whlsale Pwr & Rnwable Gen	48.63	5,297.59	4,018.68	9,364.90
DEF Fossil Hydro	18.00		968.31	986.31
DEF Other	6,306.33	912.24	516,921.82	524,140.39
DEF Power Delivery	3,690.78	13,496.20	103,826.31	121,013.29
DEF Regional Srvcs		7,730.39	47,579.69	55,310.08
DEF Retail		(0.03)	30,664.66	30,664.63
DEI Power Delivery	873.60	-	(148,191.89)	(147,318.29)
DEI President and Staff			14,060.77	14,060.77
DEP Central Progs Srvcs			39,258.04	39,258.04
DEP Environmental			(4,000.00)	(4,000.00)
DEP Fossil Hydro	2.64		189,240.67	189,243.31
DEP Gen Ops Support			-	-
DEP Nuclear	47.76		3,852.51	3,900.27
DEP Org Effectiveness	49.64	30,649.30	4,102.62	34,801.56
DEP Power Delivery	199.14	16,424.71	204,627.34	221,251.19
DEP Regional Srvcs			28,731.89	28,731.89
DEP Retail		(0.07)	31,913.36	31,913.29
Duke Energy Ohio - RU		0.01	(63,621.99)	(63,621.98)
Marketing & Customer Engagemen		(0.06)	5,780.75	5,780.69
Piedmont Gas - Customer			578.97	578.97
Piedmont Gas - Delivery	205.10	49,396.55	59,652.34	109,253.99
Piedmont Gas - Other	103.34	27,970.20	8,635.60	36,709.14
Srvco Coal Combustion Products			60,197.84	60,197.84
SrvCo Construct & Proj Mgmt	16.74	41,404.45	645,050.01	686,471.20
Srvco Customer Service	171.40	(240,274.32)	8,863,937.63	8,623,834.71

SrvCo Enterprise Business Svs	928,200.68	8,805,024.63	101,096,716.22	110,829,941.53
SrvCo EnviroHealthSafety	23,305.27	12,234.63	5,618,792.11	5,654,332.01
SrvCo Fossil Hydro Total	126.42		249,835.10	249,961.52
SrvCo Gas	22.99		7,318.91	7,341.90
SrvCo Gen Support	210,764.67	19,714.68	2,940,804.51	3,171,283.86
SrvCo Nuclear			41,891.34	41,891.34
SrvCo Other	30,198.83	91,833.41	11,875,663.23	11,997,695.47
SrvCo Power Delivery	13,686,571.00	11,200.32	9,858,314.53	23,556,085.85
Aug 2019				
100 Org Effectiveness			134,829.61	134,829.61
110 Central Progs Srvcs		32,211.96	3,906,487.37	3,938,699.33
110 Regional Srvcs			420,016.23	420,016.23
Corporate Governance DiscOps	1,347.50	20,469.73	2,852,365.64	2,874,182.87
DE Renewables & Transmission	25.85		2,136.46	2,162.31
DEC Central Programs Services		25,029.92	198,382.97	223,412.89
DEC Customer	17,334.80	48,470.39	253,320.89	319,126.08
DEC Customer Experience	6,596.57	71,349.93	69,672.63	147,619.13
DEC Environmental			86,200.56	86,200.56
DEC Fleet Maint Srvcs			-	-
DEC Fossil Hydro	9.06	1,363.71	7,268.43	8,641.20
DEC Fossil Hydro Gen Support			502.36	502.36
DEC Nuclear	3,352.85	17,410.55	67,749.62	88,513.02
DEC Org Effectiveness		36,704.18	(578.66)	36,125.52
DEC Other		-	132,176.00	132,176.00
DEC Other Misc	186.54	50,570.60	16,262.86	67,020.00
DEC Power Delivery	7,403.15	61,657.88	541,355.40	610,416.43
DEC President & Staff			-	-
DEC Rates			3,870.21	3,870.21
DEC Regional Srvcs			943.75	943.75
DEC Whlsale Pwr & Rnwable Gen	50.50	5,452.15	4,173.24	9,675.89
DEF Fossil Hydro	18.00		968.31	986.31
DEF Other	7,795.97	912.24	639,023.82	647,732.03
DEF Power Delivery	3,736.73	19,037.69	92,632.44	115,406.86

DEF Regional Srvcs		13,082.25	51,225.97	64,308.22
DEF Retail		(0.03)	20,734.45	20,734.42
DEI Power Delivery	873.60	-	(120,201.25)	(119,327.65)
DEI President and Staff			3,563.27	3,563.27
DEP Central Progs Srvcs			45,245.69	45,245.69
DEP Environmental			(4,000.00)	(4,000.00)
DEP Fossil Hydro	2.64		218,047.91	218,050.55
DEP Gen Ops Support			-	-
DEP Nuclear	47.76		3,852.51	3,900.27
DEP Org Effectiveness	49.64	38,228.76	4,102.62	42,381.02
DEP Power Delivery	245.56	18,643.64	158,912.26	177,801.46
DEP Regional Srvcs			5,268.69	5,268.69
DEP Retail		(0.06)	31,934.55	31,934.49
Duke Energy Ohio - RU		0.01	(76,356.94)	(76,356.93)
Marketing & Customer Engagemen		(0.06)	5,780.75	5,780.69
Piedmont Gas - Customer			578.97	578.97
Piedmont Gas - Delivery	228.33	55,930.25	63,978.85	120,137.43
Piedmont Gas - Other	103.34	35,545.40	8,635.60	44,284.34
Srvco Coal Combustion Products			92,336.64	92,336.64
SrvCo Construct & Proj Mgmt	16.74	45,477.31	722,371.67	767,865.72
Srvco Customer Service	174.71	(233,857.00)	10,351,288.48	10,117,606.19
SrvCo Enterprise Business Svs	1,068,523.65	10,984,121.86	115,946,669.06	127,999,314.57
SrvCo EnviroHealthSafety	25,395.35	13,315.07	6,324,366.00	6,363,076.42
SrvCo Fossil Hydro Total	126.42		286,278.11	286,404.53
SrvCo Gas	22.99		8,458.05	8,481.04
SrvCo Gen Support	301,627.54	19,714.68	3,235,062.89	3,556,405.11
SrvCo Nuclear			48,390.17	48,390.17
SrvCo Other	34,003.07	103,254.46	13,570,782.12	13,708,039.65
SrvCo Power Delivery	16,530,547.69	12,626.20	11,280,813.21	27,823,987.10
Sep 2019				
100 Org Effectiveness			149,957.91	149,957.91
110 Central Progs Srvcs		38,394.64	4,399,728.82	4,438,123.46
110 Regional Srvcs			460,947.99	460,947.99

Corporate Governance DiscOps	1,455.53	20,469.73	2,780,413.51	2,802,338.77
DE Renewables & Transmission	25.85		2,136.46	2,162.31
DEC Central Programs Services		32,589.62	232,063.00	264,652.62
DEC Customer	17,299.33	62,431.96	258,421.29	338,152.58
DEC Customer Experience	3,681.08	84,569.71	56,037.19	144,287.98
DEC Environmental			89,113.91	89,113.91
DEC Fleet Maint Srvcs			-	-
DEC Fossil Hydro	9.06	1,363.71	20,771.90	22,144.67
DEC Fossil Hydro Gen Support			502.36	502.36
DEC Nuclear	3,368.71	22,972.67	75,679.89	102,021.27
DEC Org Effectiveness		40,980.06	631.08	41,611.14
DEC Other		-	144,763.13	144,763.13
DEC Other Misc	204.87	55,408.74	17,777.92	73,391.53
DEC Power Delivery	8,914.02	70,826.72	322,265.47	402,006.21
DEC President & Staff			-	-
DEC Rates			3,870.21	3,870.21
DEC Regional Srvcs			943.75	943.75
DEC Whlsale Pwr & Rnwable Gen	53.52	5,701.31	4,422.40	10,177.23
DEF Fossil Hydro	18.00		968.31	986.31
DEF Other	8,593.98	912.24	704,434.15	713,940.37
DEF Power Delivery	3,719.69	20,681.89	97,949.95	122,351.53
DEF Regional Srvcs		19,772.01	52,898.37	72,670.38
DEF Retail		(0.05)	20,734.45	20,734.40
DEI Power Delivery	873.60	-	(96,445.51)	(95,571.91)
DEI President and Staff			5,440.45	5,440.45
DEP Central Progs Srvcs			49,549.21	49,549.21
DEP Environmental			(3,000.00)	(3,000.00)
DEP Fossil Hydro	2.64		237,429.69	237,432.33
DEP Gen Ops Support			-	-
DEP Nuclear	47.76		3,852.51	3,900.27
DEP Org Effectiveness	67.79	45,382.05	5,602.62	51,052.46
DEP Power Delivery	1,256.07	20,176.69	82,972.49	104,405.25
DEP Regional Srvcs			5,421.84	5,421.84

DEP Retail		(0.07)		31,934.55	31,934.48
Duke Energy Ohio - RU		0.01		(83,892.41)	(83,892.40)
Marketing & Customer Engagemen		(0.07)		5,780.75	5,780.68
Piedmont Gas - Customer				578.97	578.97
Piedmont Gas - Delivery	230.84	63,657.07		74,471.32	138,359.23
Piedmont Gas - Other	103.34	32,102.12		8,635.60	40,841.06
Srvco Coal Combustion Products				113,897.61	113,897.61
SrvCo Construct & Proj Mgmt	16.74	48,846.44		784,958.95	833,822.13
Srvco Customer Service	177.52	(225,078.26)		11,356,843.42	11,131,942.68
SrvCo Enterprise Business Svs	1,198,062.89	12,261,401.19		129,537,240.86	142,996,704.94
SrvCo EnviroHealthSafety	26,714.94	14,060.83		6,990,263.18	7,031,038.95
SrvCo Fossil Hydro Total	126.42			323,645.69	323,772.11
SrvCo Gas	22.99			9,695.65	9,718.64
SrvCo Gen Support	385,860.42	19,714.68		3,529,573.39	3,935,148.49
SrvCo Nuclear				54,839.75	54,839.75
SrvCo Other	38,934.98	110,497.62		15,192,271.59	15,341,704.19
SrvCo Power Delivery	18,386,769.94	14,144.68	2,009.72	12,517,006.84	30,919,931.18
Grand Total	**$ 21,257,033.11**	**$ 14,604,718.52**	**$ 3,067.64**	**$201,320,312.32**	**$237,185,131.59**

Actual - 12 months ending December 2018 **See second query for department detail**

Business Unit Hierarchy **Duke Energy Kentucky Electric**

	ASSET - Assets	CAPITAL - Capital	INDIRECT - Indirect	O&M and Other Expenses	Grand Total
Q1 2018					
Jan 2018	$ 1,746,386.17	$ 697,883.11		$ 20,489,890.01	$ 22,934,159.29
Feb 2018	3,917,555.32	1,514,437.35		42,575,492.14	48,007,484.81
Mar 2018	6,802,327.11	2,434,440.07	(1,461.68)	65,643,118.27	74,878,423.77
Q2 2018					
Apr 2018	8,878,954.63	3,301,479.46	-	88,944,681.28	101,125,115.37
May 2018	10,993,763.26	4,244,631.50	-	111,932,606.39	127,171,001.15
Jun 2018	12,979,791.92	5,384,150.80	-	135,171,819.74	153,535,762.46
Q3 2018					
Jul 2018	14,914,631.92	6,184,631.42	-	155,487,615.31	176,586,878.65
Aug 2018	17,844,703.92	7,187,629.35	-	179,397,456.85	204,429,790.12
Sep 2018	18,713,230.54	8,132,410.26	-	201,897,052.08	228,742,692.88
Q4 2018					
Oct 2018	20,840,399.83	9,969,849.48	-	224,590,574.53	255,400,823.84
Nov 2018	22,920,151.55	10,943,364.69	-	245,933,421.31	279,796,937.55
Dec 2018	24,210,037.93	13,543,942.76	-	262,822,916.45	300,576,897.14
Grand Total	**$ 24,210,037.93**	**$ 13,543,942.76**	**$ -**	**$262,822,916.45**	**$300,576,897.14**

Business Unit Hierarchy **Duke Energy Kentucky Electric**

	ASSET - Assets	CAPITAL - Capital	INDIRECT - Indirect	O&M and Other Expenses	Grand Total
Q1 2018					
Jan 2018					
100 Org Effectiveness				$ 6,015.90	$ 6,015.90
110 Central Progs Srvcs				468,235.11	468,235.11

110 Regional Srvcs			49,259.52	49,259.52
Corporate Governance DiscOps	88.09	1,678.76	(289,445.98)	(287,679.13)
DEC Central Programs Services			39,273.57	39,273.57
DEC Coal Combustion Products			750.00	750.00
DEC Customer	22.34	419.90	64,279.96	64,722.20
DEC Customer Experience		4,417.64	10,149.11	14,566.75
DEC Environmental	20.54	-	10,349.52	10,370.06
DEC Fleet Maint Srvcs			1,788.00	1,788.00
DEC Fossil Hydro			2,242.90	2,242.90
DEC Nuclear	71.83		5,882.58	5,954.41
DEC Org Effectiveness			40,803.96	40,803.96
DEC Other			2,714.00	2,714.00
DEC Other Misc	82.45		11,208.24	11,290.69
DEC Power Delivery	21.92	7,664.73	132,062.79	139,749.44
DEC Regional Srvcs			6,487.42	6,487.42
DEC Whlsale Pwr & Rnwable Gen	25.27	3,384.36	2,255.88	5,665.51
DEF Fossil Hydro			870.57	870.57
DEF Other	201.69		17,737.82	17,939.51
DEF Power Delivery	473.40	(0.01)	77,244.73	77,718.12
DEI Power Delivery	290.88		16,483.11	16,773.99
DEP Central Progs Srvcs			5,403.05	5,403.05
DEP Environmental	35.16	-	(1,422.10)	(1,386.94)
DEP Fossil Hydro			17,745.26	17,745.26
DEP Gen Ops Support			17,230.46	17,230.46
DEP Power Delivery	2.34	1,856.69	17,720.37	19,579.40
Duke Energy Ohio - RU			8,014.70	8,014.70
Marketing & Customer Engagemen			6,866.52	6,866.52
Piedmont Gas - Customer			1,173.30	1,173.30
Piedmont Gas - Delivery			7,867.99	7,867.99
Piedmont Gas - Other			4,934.07	4,934.07
SrvCo Construct & Proj Mgmt	11.23	7,842.78	37,691.54	45,545.55
Srvco Customer Service	33.56	41.86	1,147,091.77	1,147,167.19
SrvCo Enterprise Business Svs	126,785.80	667,909.78	14,454,318.00	15,249,013.58

SrvCo EnviroHealthSafety	4,280.17	2,666.71	901,641.84	908,588.72
SrvCo Fossil Hydro Total			26,537.60	26,537.60
SrvCo Gas			22,361.54	22,361.54
SrvCo Gen Support	135,554.01		318,208.87	453,762.88
SrvCo Nuclear			6,575.96	6,575.96
SrvCo Other	2,163.86		1,647,852.40	1,650,016.26
SrvCo Power Delivery	1,476,221.63	(0.09)	1,165,428.16	2,641,649.70
Feb 2018				
100 Org Effectiveness			13,787.49	13,787.49
110 Central Progs Srvcs			961,559.59	961,559.59
110 Regional Srvcs			103,495.67	103,495.67
Corporate Governance DiscOps	216.41	3,376.19	(529,328.29)	(525,735.69)
DEC Central Programs Services			74,028.63	74,028.63
DEC Coal Combustion Products			750.00	750.00
DEC Customer	22.34	776.27	140,321.50	141,120.11
DEC Customer Experience		11,069.68	22,808.50	33,878.18
DEC Environmental	20.54	-	21,911.08	21,931.62
DEC Fleet Maint Srvcs			4,395.68	4,395.68
DEC Fossil Hydro			4,963.25	4,963.25
DEC Nuclear	180.01		17,578.30	17,758.31
DEC Org Effectiveness			86,215.38	86,215.38
DEC Other			6,234.00	6,234.00
DEC Other Misc	99.71	5,555.79	14,193.77	19,849.27
DEC Power Delivery	102.53	8,741.00	273,377.67	282,221.20
DEC Regional Srvcs			11,861.42	11,861.42
DEC Whlsale Pwr & Rnwable Gen	54.64	7,318.68	4,878.36	12,251.68
DEF Fossil Hydro			1,628.89	1,628.89
DEF Other	435.38		38,259.86	38,695.24
DEF Power Delivery	1,131.61	(0.01)	94,994.49	96,126.09
DEF Retail	0.14		12.90	13.04
DEI Power Delivery	2,399.76		(51,055.42)	(48,655.66)
DEK Power Delivery			(6,173.79)	(6,173.79)
DEP Central Progs Srvcs			11,093.94	11,093.94

DEP Environmental	35.16	-	(1,422.10)	(1,386.94)
DEP Fossil Hydro			56,403.35	56,403.35
DEP Gen Ops Support			26,775.41	26,775.41
DEP Power Delivery	4.95	1,856.66	33,531.73	35,393.34
Duke Energy Ohio - RU			4,584.73	4,584.73
Marketing & Customer Engagemen			6,574.54	6,574.54
Piedmont Gas - Customer			4,068.45	4,068.45
Piedmont Gas - Delivery	33.54		44,454.25	44,487.79
Piedmont Gas - Other			26,268.88	26,268.88
SrvCo Construct & Proj Mgmt	23.35	15,872.28	78,090.43	93,986.06
Srvco Customer Service	46.63	249.24	2,406,604.26	2,406,900.13
SrvCo Enterprise Business Svs	262,758.08	1,451,835.68	30,038,630.78	31,753,224.54
SrvCo EnviroHealthSafety	8,031.99	3,140.83	1,825,476.13	1,836,648.95
SrvCo Fossil Hydro Total			56,621.84	56,621.84
SrvCo Gas			45,603.46	45,603.46
SrvCo Gen Support	264,858.82		660,698.37	925,557.19
SrvCo Nuclear			13,150.75	13,150.75
SrvCo Other	4,483.96	4,645.27	3,408,206.94	3,417,336.17
SrvCo Power Delivery	3,372,615.77	(0.21)	2,519,377.07	5,891,992.63
Mar 2018				
100 Org Effectiveness			25,626.00	25,626.00
110 Central Progs Srvcs	5.12		1,470,326.02	1,470,331.14
110 Regional Srvcs			151,524.75	151,524.75
Corporate Governance DiscOps	371.94	5,936.43	(649,919.58)	(643,611.21)
DEC Central Programs Services			96,834.26	96,834.26
DEC Coal Combustion Products			750.00	750.00
DEC Customer	22.34	1,135.33	101,368.72	102,526.39
DEC Customer Experience	51.83	17,542.87	42,741.59	60,336.29
DEC Environmental	20.54	-	36,287.29	36,307.83
DEC Fleet Maint Srvcs			4,395.68	4,395.68
DEC Fossil Hydro			4,963.25	4,963.25
DEC Nuclear	328.26		29,251.49	29,579.75
DEC Org Effectiveness			-	-

DEC Other				11,487.44	11,487.44
DEC Other Misc	136.01	11,961.96		34,203.62	46,301.59
DEC Power Delivery	119.20	25,043.42		416,398.00	441,560.62
DEC Regional Srvcs				18,506.72	18,506.72
DEC Whlsale Pwr & Rnwable Gen	81.89	10,968.28		7,311.56	18,361.73
DEF Fossil Hydro				2,337.69	2,337.69
DEF Other	773.89	447.50		68,018.00	69,239.39
DEF Power Delivery	1,137.10	(0.02)		100,191.84	101,328.92
DEF Retail	1.52			136.02	137.54
DEI Fossil Hydro				178.08	178.08
DEI Power Delivery	4,120.25			(23,494.51)	(19,374.26)
DEK Power Delivery				(6,173.79)	(6,173.79)
DEP Central Progs Srvcs				16,930.09	16,930.09
DEP Environmental	35.16	-		(1,422.10)	(1,386.94)
DEP Fossil Hydro				78,884.92	78,884.92
DEP Gen Ops Support				26,775.41	26,775.41
DEP Power Delivery	7.49	1,856.65		56,619.97	58,484.11
Duke Energy Ohio - RU				15,586.98	15,586.98
Marketing & Customer Engagemen				10,284.45	10,284.45
Piedmont Gas - Customer				7,241.16	7,241.16
Piedmont Gas - Delivery	40.98			63,570.29	63,611.27
Piedmont Gas - Other				39,492.20	39,492.20
SrvCo Construct & Proj Mgmt	36.56	20,093.36		118,130.16	138,260.08
Srvco Customer Service	46.63	258.36		3,887,350.09	3,887,655.08
SrvCo Enterprise Business Svs	403,925.72	2,311,392.94	(1,461.68)	46,423,532.15	49,137,389.13
SrvCo EnviroHealthSafety	12,411.33	6,484.27		2,777,816.43	2,796,712.03
SrvCo Fossil Hydro Total				92,241.99	92,241.99
SrvCo Gas				59,999.06	59,999.06
SrvCo Gen Support	415,282.58			1,008,003.24	1,423,285.82
SrvCo Nuclear				19,882.56	19,882.56
SrvCo Other	6,898.77	21,319.03		5,137,686.94	5,165,904.74
SrvCo Power Delivery	5,956,472.00	(0.31)		3,861,262.14	9,817,733.83
Q2 2018					

Apr 2018				
100 Org Effectiveness			37,284.54	37,284.54
110 Central Progs Srvcs	5.12		1,970,977.69	1,970,982.81
110 Regional Srvcs			202,199.80	202,199.80
Corporate Governance DiscOps	442.63	10,055.15	559,058.16	569,555.94
DEC Central Programs Services			103,203.26	103,203.26
DEC Coal Combustion Products			750.00	750.00
DEC Customer	22.34	1,462.25	128,380.17	129,864.76
DEC Customer Experience	163.52	27,336.17	60,505.13	88,004.82
DEC Environmental	20.54	-	48,643.93	48,664.47
DEC Fleet Maint Srvcs			4,395.68	4,395.68
DEC Fossil Hydro		871.20	4,963.25	5,834.45
DEC Nuclear	432.64		37,470.74	37,903.38
DEC Org Effectiveness			-	-
DEC Other	53.37	(4,764.94)	19,745.82	15,034.25
DEC Other Misc	159.19	19,008.19	24,504.30	43,671.68
DEC Power Delivery	137.59	25,368.59	577,220.90	602,727.08
DEC Regional Srvcs			26,274.12	26,274.12
DEC Whlsale Pwr & Rnwable Gen	105.05	14,070.10	9,379.72	23,554.87
DEF Fossil Hydro			4,337.69	4,337.69
DEF Other	1,024.61	447.51	90,042.44	91,514.56
DEF Power Delivery	4,262.05	(0.02)	104,030.74	108,292.77
DEF Retail	2.33		208.62	210.95
DEI Fossil Hydro			178.08	178.08
DEI Power Delivery	4,120.25		(2,953.35)	1,166.90
DEK Fossil			918.05	918.05
DEK Power Delivery			(6,173.79)	(6,173.79)
DEP Central Progs Srvcs			23,516.24	23,516.24
DEP Environmental	35.16	-	(1,422.10)	(1,386.94)
DEP Fossil Hydro			106,367.66	106,367.66
DEP Gen Ops Support			26,775.41	26,775.41
DEP Nuclear			3,089.25	3,089.25
DEP Power Delivery	9.77	2,423.35	108,295.81	110,728.93

Duke Energy Ohio - RU				24,233.50	24,233.50
Marketing & Customer Engagemen				14,266.62	14,266.62
Piedmont Gas - Customer				8,726.38	8,726.38
Piedmont Gas - Delivery	40.98			81,685.35	81,726.33
Piedmont Gas - Other				56,650.19	56,650.19
SrvCo Construct & Proj Mgmt	50.63	20,093.36		159,558.34	179,702.33
Srvco Customer Service	46.63	258.29		5,269,755.62	5,270,060.54
SrvCo Enterprise Business Svs	536,310.83	3,144,056.34	-	61,752,194.12	65,432,561.29
SrvCo EnviroHealthSafety	16,248.54	8,619.87		3,672,176.49	3,697,044.90
SrvCo Fossil Hydro Total				120,836.41	120,836.41
SrvCo Gas				84,642.98	84,642.98
SrvCo Gen Support	554,313.60			1,362,854.27	1,917,167.87
SrvCo Nuclear				26,336.41	26,336.41
SrvCo Other	9,516.17	32,174.40		6,787,889.93	6,829,580.50
SrvCo Power Delivery	7,751,431.09	(0.35)		5,250,706.71	13,002,137.45
May 2018					
100 Org Effectiveness				48,668.38	48,668.38
110 Central Progs Srvcs	5.12			2,439,557.41	2,439,562.53
110 Regional Srvcs				253,913.91	253,913.91
Corporate Governance DiscOps	513.10	13,227.07		1,770,219.06	1,783,959.23
DEC Central Programs Services				130,444.82	130,444.82
DEC Coal Combustion Products				750.00	750.00
DEC Customer	-	2,637.52		170,329.85	172,967.37
DEC Customer Experience	263.42	40,671.07		84,412.41	125,346.90
DEC Environmental	20.54	-		60,620.29	60,640.83
DEC Fleet Maint Srvcs				4,395.68	4,395.68
DEC Fossil Hydro		871.20		4,963.25	5,834.45
DEC Nuclear	478.74			37,695.79	38,174.53
DEC Org Effectiveness				7,764.88	7,764.88
DEC Other	53.37	(4,764.94)		23,521.18	18,809.61
DEC Other Misc	190.85	25,167.79		27,331.02	52,689.66
DEC Power Delivery	153.35	27,066.01		726,763.34	753,982.70
DEC Regional Srvcs				35,196.59	35,196.59

DEC Whlsale Pwr & Rnwable Gen	133.62	17,898.10		11,930.87	29,962.59
DEF Fossil Hydro				7,599.78	7,599.78
DEF Other	1,298.98	492.27		114,146.06	115,937.31
DEF Power Delivery	6,010.66	31.25		124,363.35	130,405.26
DEF Retail	2.80			7,898.30	7,901.10
DEI Customer				1,356.56	1,356.56
DEI Fossil Hydro				244.86	244.86
DEI Power Delivery	7,406.50			13,479.91	20,886.41
DEK Fossil				918.05	918.05
DEK Power Delivery				(6,173.79)	(6,173.79)
DEP Central Progs Srvcs				29,084.31	29,084.31
DEP Environmental	35.16	-		(1,422.10)	(1,386.94)
DEP Fossil Hydro				134,082.48	134,082.48
DEP Gen Ops Support				26,775.41	26,775.41
DEP Nuclear				3,089.25	3,089.25
DEP Power Delivery	12.33	2,423.34		162,934.63	165,370.30
DEP Retail				497.71	497.71
Duke Energy Ohio - RU				32,106.03	32,106.03
Marketing & Customer Engagemen				18,177.66	18,177.66
Piedmont Gas - Customer				10,555.15	10,555.15
Piedmont Gas - Delivery	40.98			101,427.15	101,468.13
Piedmont Gas - Other				73,254.12	73,254.12
SrvCo Construct & Proj Mgmt	63.08	20,093.36		197,993.55	218,149.99
Srvco Customer Service	82.00	258.26		6,674,748.40	6,675,088.66
SrvCo Enterprise Business Svs	659,775.42	4,045,821.12	-	76,791,352.40	81,496,948.94
SrvCo EnviroHealthSafety	18,210.32	9,319.77		4,495,875.95	4,523,406.04
SrvCo Fossil Hydro Total				150,289.01	150,289.01
SrvCo Gas				98,081.82	98,081.82
SrvCo Gen Support	706,174.87			1,698,249.55	2,404,424.42
SrvCo Nuclear				31,143.58	31,143.58
SrvCo Other	11,882.75	43,418.80		8,446,784.74	8,502,086.29
SrvCo Power Delivery	9,580,955.30	(0.49)		6,655,213.78	16,236,168.59
Jun 2018					

100 Org Effectiveness			61,567.26	61,567.26
110 Central Progs Srvcs	5.12		2,906,429.17	2,906,434.29
110 Regional Srvcs			307,280.23	307,280.23
Corporate Governance DiscOps	622.94	17,142.59	3,190,304.97	3,208,070.50
DEC Central Programs Services			160,538.41	160,538.41
DEC Coal Combustion Products			750.00	750.00
DEC Customer	-	3,336.81	281,796.73	285,133.54
DEC Customer Experience	367.25	52,874.26	104,091.52	157,333.03
DEC Environmental	20.54	-	73,429.31	73,449.85
DEC Fleet Maint Srvcs			4,395.68	4,395.68
DEC Fossil Hydro		871.20	5,445.45	6,316.65
DEC Nuclear	601.02		43,494.53	44,095.55
DEC Org Effectiveness			-	-
DEC Other	53.37	(4,764.94)	27,190.30	22,478.73
DEC Other Misc	212.46	32,504.67	29,260.48	61,977.61
DEC Power Delivery	172.77	28,432.14	865,566.90	894,171.81
DEC Regional Srvcs			44,334.13	44,334.13
DEC Whlsale Pwr & Rnwable Gen	158.92	21,287.39	14,418.61	35,864.92
DEF Fossil Hydro			9,983.10	9,983.10
DEF Other	1,609.31	492.26	141,396.35	143,497.92
DEF Power Delivery	6,725.12	177.11	159,344.89	166,247.12
DEF President & Staff			32,458.34	32,458.34
DEF Retail	3.27		15,292.55	15,295.82
DEI Customer			-	-
DEI Fossil Hydro			244.86	244.86
DEI Power Delivery	8,305.30		33,087.65	41,392.95
DEK Fossil			918.05	918.05
DEK Power Delivery			(6,173.79)	(6,173.79)
DEP Central Progs Srvcs			34,621.75	34,621.75
DEP Environmental	35.16	-	(882.82)	(847.66)
DEP Fossil Hydro			161,420.25	161,420.25
DEP Gen Ops Support			26,775.41	26,775.41
DEP Nuclear			-	-

DEP Power Delivery	17.24	2,423.32		152,959.79	155,400.35
DEP Retail				4,205.11	4,205.11
Duke Energy Ohio - RU				53,121.14	53,121.14
Marketing & Customer Engagemen				22,073.10	22,073.10
Piedmont Gas - Customer				11,197.12	11,197.12
Piedmont Gas - Delivery	115.72			132,498.87	132,614.59
Piedmont Gas - Other				91,115.10	91,115.10
SrvCo Construct & Proj Mgmt	74.27	20,093.36		245,268.72	265,436.35
Srvco Customer Service	82.00	539.18		7,875,066.78	7,875,687.96
SrvCo Enterprise Business Svs	783,404.70	5,141,938.85	-	91,880,648.10	97,805,991.65
SrvCo EnviroHealthSafety	20,302.39	12,243.21		5,324,094.09	5,356,639.69
SrvCo Fossil Hydro Total				181,468.67	181,468.67
SrvCo Gas				108,057.22	108,057.22
SrvCo Gen Support	854,872.43			2,052,437.94	2,907,310.37
SrvCo Nuclear				37,789.08	37,789.08
SrvCo Other	14,266.51	54,560.02		10,152,658.86	10,221,485.39
SrvCo Power Delivery	11,287,764.11	(0.63)		8,118,379.78	19,406,143.26
Q3 2018					
Jul 2018					
100 Org Effectiveness				73,278.49	73,278.49
110 Central Progs Srvcs	5.12			3,336,883.73	3,336,888.85
110 Regional Srvcs				364,104.89	364,104.89
Corporate Governance DiscOps	2,003.53	21,199.09		3,082,157.74	3,105,360.36
DEC Central Programs Services				26,688.01	26,688.01
DEC Coal Combustion Products				750.00	750.00
DEC Customer	-	3,498.89		329,989.54	333,488.43
DEC Customer Experience	457.91	61,974.76		122,900.15	185,332.82
DEC Environmental	20.54	-		85,774.16	85,794.70
DEC Fleet Maint Srvcs				4,395.68	4,395.68
DEC Fossil Hydro		871.20		9,104.92	9,976.12
DEC Gen Ops Support				250.00	250.00
DEC Nuclear	629.56			52,774.79	53,404.35
DEC Org Effectiveness				6,132.60	6,132.60

DEC Other	53.37	(4,764.94)	30,655.58	25,944.01
DEC Other Misc	237.06	37,258.38	31,457.29	68,952.73
DEC Power Delivery	186.27	29,060.01	1,024,914.51	1,054,160.79
DEC Regional Srvcs			54,084.04	54,084.04
DEC Whlsale Pwr & Rnwable Gen	184.65	24,733.58	18,239.60	43,157.83
DEF Fossil Hydro			14,702.06	14,702.06
DEF Other	1,910.33	492.25	167,837.84	170,240.42
DEF Power Delivery	7,067.84	177.09	162,177.17	169,422.10
DEF President & Staff			63,293.80	63,293.80
DEF Regional Srvcs			40.54	40.54
DEF Retail	3.43		20,368.56	20,371.99
DEI Customer			-	-
DEI Fossil Hydro			445.20	445.20
DEI Power Delivery	2.48		46,435.87	46,438.35
DEK Fossil			918.05	918.05
DEK Power Delivery			(6,173.79)	(6,173.79)
DEP Central Progs Srvcs			40,129.48	40,129.48
DEP Environmental	35.16	-	(433.42)	(398.26)
DEP Fossil Hydro			140,059.08	140,059.08
DEP Gen Ops Support			27,025.41	27,025.41
DEP Nuclear			-	-
DEP Other			6,619.08	6,619.08
DEP Power Delivery	20.81	2,423.30	200,845.67	203,289.78
DEP Retail	0.82		7,622.48	7,623.30
Duke Energy Ohio - RU			62,285.61	62,285.61
Marketing & Customer Engagemen			25,541.99	25,541.99
Piedmont Gas - Customer			11,630.79	11,630.79
Piedmont Gas - Delivery	116.40		151,294.07	151,410.47
Piedmont Gas - Other			104,429.22	104,429.22
SrvCo Construct & Proj Mgmt	86.68	20,093.36	298,486.92	318,666.96
Srvco Customer Service	82.00	539.18	9,215,297.23	9,215,918.41
SrvCo Enterprise Business Svs	901,213.77	5,907,679.88	106,019,633.39	112,828,527.04
SrvCo EnviroHealthSafety	22,582.33	15,599.75	6,128,154.23	6,166,336.31

SrvCo Fossil Hydro Total			217,248.25	217,248.25
SrvCo Gas			125,252.62	125,252.62
SrvCo Gen Support	1,010,072.46		2,382,024.94	3,392,097.40
SrvCo Nuclear			43,451.20	43,451.20
SrvCo Other	16,191.49	63,796.42	11,683,392.73	11,763,380.64
SrvCo Power Delivery	12,951,467.91	(0.78)	9,473,043.32	22,424,510.45
Aug 2018				
100 Org Effectiveness			87,276.98	87,276.98
110 Central Progs Srvcs	54.29		3,874,703.21	3,874,757.50
110 Regional Srvcs			439,235.10	439,235.10
Corporate Governance DiscOps	2,090.37	25,679.91	3,049,868.49	3,077,638.77
DEC Central Programs Services			55,721.37	55,721.37
DEC Coal Combustion Products			750.00	750.00
DEC Customer	-	3,576.23	389,118.70	392,694.93
DEC Customer Experience	562.75	70,005.06	145,540.05	216,107.86
DEC Environmental	20.54	-	93,968.45	93,988.99
DEC Fleet Maint Srvcs			4,395.68	4,395.68
DEC Fossil Hydro		871.20	9,104.92	9,976.12
DEC Gen Ops Support			250.00	250.00
DEC Nuclear	675.66	2,074.20	60,942.75	63,692.61
DEC Org Effectiveness			6,132.60	6,132.60
DEC Other	53.37	(4,764.94)	36,001.58	31,290.01
DEC Other Misc	267.86	44,698.19	34,207.20	79,173.25
DEC Power Delivery	911.39	30,131.06	1,164,995.12	1,196,037.57
DEC Regional Srvcs			61,838.10	61,838.10
DEC Whlsale Pwr & Rnwable Gen	207.30	27,768.35	20,262.28	48,237.93
DEF Fossil Hydro			19,409.10	19,409.10
DEF Other	2,485.50	492.26	218,333.93	221,311.69
DEF Power Delivery	7,982.16	177.08	197,109.30	205,268.54
DEF President & Staff			98,002.03	98,002.03
DEF Regional Srvcs			153.17	153.17
DEF Retail	3.60		26,564.65	26,568.25
DEI Customer			664.96	664.96

DEI Fossil Hydro				601.02	601.02
DEI Power Delivery	5,171.51	-		64,509.11	69,680.62
DEK Fossil				918.05	918.05
DEK Power Delivery				(6,173.79)	(6,173.79)
DEP Central Progs Srvcs				44,523.26	44,523.26
DEP Environmental	35.16	-		285.62	320.78
DEP Fossil Hydro				157,532.51	157,532.51
DEP Gen Ops Support				27,025.41	27,025.41
DEP Nuclear				-	-
DEP Other				3,837.21	3,837.21
DEP Power Delivery	37.36	2,423.27		250,729.33	253,189.96
DEP Retail	0.82			11,055.74	11,056.56
Duke Energy Ohio - Com Power				43.17	43.17
Duke Energy Ohio - RU				66,404.88	66,404.88
Marketing & Customer Engagemen				29,623.06	29,623.06
Piedmont Gas - Customer				13,414.16	13,414.16
Piedmont Gas - Delivery	122.20			171,285.70	171,407.90
Piedmont Gas - Other				110,604.10	110,604.10
SrvCo Construct & Proj Mgmt	100.93	20,093.36		353,966.21	374,160.50
Srvco Customer Service	82.60	540.24		10,966,780.63	10,967,403.47
SrvCo Enterprise Business Svs	1,033,477.68	6,861,529.82	-	122,558,512.85	130,453,520.35
SrvCo EnviroHealthSafety	26,583.38	20,787.37		7,021,034.91	7,068,405.66
SrvCo Fossil Hydro Total	147.60			252,266.36	252,413.96
SrvCo Gas				141,328.26	141,328.26
SrvCo Gen Support	1,176,022.79			2,742,173.95	3,918,196.74
SrvCo Nuclear				50,115.30	50,115.30
SrvCo Other	18,272.92	81,547.63		13,381,704.88	13,481,525.43
SrvCo Power Delivery	15,569,334.18	(0.94)		10,888,805.24	26,458,138.48
Sep 2018					
100 Org Effectiveness				99,054.43	99,054.43
110 Central Progs Srvcs	54.29			4,360,310.14	4,360,364.43
110 Regional Srvcs				503,905.65	503,905.65
Corporate Governance DiscOps	1,017.69	31,052.94		3,471,660.96	3,503,731.59

DEC Central Programs Services			80,007.49	80,007.49
DEC Coal Combustion Products			750.00	750.00
DEC Customer	-	10,305.54	270,281.15	280,586.69
DEC Customer Experience	667.69	75,457.93	167,908.14	244,033.76
DEC Environmental	20.54	-	109,485.33	109,505.87
DEC Fleet Maint Srvcs			4,395.68	4,395.68
DEC Fossil Hydro		871.20	9,588.64	10,459.84
DEC Gen Ops Support			250.00	250.00
DEC Nuclear	696.96	2,074.20	48,083.93	50,855.09
DEC Org Effectiveness			6,132.60	6,132.60
DEC Other	53.37	(4,764.94)	40,180.30	35,468.73
DEC Other Misc	296.63	48,483.22	36,775.62	85,555.47
DEC Power Delivery	861.53	30,131.02	1,083,644.22	1,114,636.77
DEC Regional Srvcs			70,023.65	70,023.65
DEC Whlsale Pwr & Rnwable Gen	237.15	31,767.49	22,927.56	54,932.20
DEF Fossil Hydro			2,000.00	2,000.00
DEF Other	2,832.32	492.26	248,776.23	252,100.81
DEF Power Delivery	7,992.96	177.08	238,965.34	247,135.38
DEF President & Staff			1,660.05	1,660.05
DEF Regional Srvcs			153.17	153.17
DEF Retail	3.60		31,391.14	31,394.74
DEI Customer			664.96	664.96
DEI Fossil Hydro			601.02	601.02
DEI Power Delivery	6,743.51	-	79,127.23	85,870.74
DEK Fossil			918.05	918.05
DEK Power Delivery			(6,173.79)	(6,173.79)
DEP Central Progs Srvcs			49,739.28	49,739.28
DEP Environmental	35.16	-	285.62	320.78
DEP Fossil Hydro			179,643.89	179,643.89
DEP Gen Ops Support			27,025.41	27,025.41
DEP Nuclear			-	-
DEP Other			3,837.21	3,837.21
DEP Power Delivery	43.95	2,516.58	291,747.95	294,308.48

DEP Retail	0.82			11,908.64	11,909.46
Duke Energy Ohio - Com Power				43.17	43.17
Duke Energy Ohio - RU				76,517.85	76,517.85
Marketing & Customer Engagemen				37,374.67	37,374.67
Piedmont Gas - Customer				4,823.57	4,823.57
Piedmont Gas - Delivery	158.66	3,298.97		186,646.87	190,104.50
Piedmont Gas - Other				111,139.58	111,139.58
SrvCo Construct & Proj Mgmt	115.39	20,093.36		403,485.19	423,693.94
Srvco Customer Service	82.60	540.22		11,924,855.96	11,925,478.78
SrvCo Enterprise Business Svs	1,149,778.22	7,764,798.35	-	137,614,528.67	146,529,105.24
SrvCo EnviroHealthSafety	29,607.69	23,202.60		7,869,480.65	7,922,290.94
SrvCo Fossil Hydro Total	147.60			288,298.19	288,445.79
SrvCo Gas				163,513.29	163,513.29
SrvCo Gen Support	167,434.76			4,261,837.50	4,429,272.26
SrvCo Nuclear				55,066.62	55,066.62
SrvCo Other	21,864.05	91,913.22		15,172,017.32	15,285,794.59
SrvCo Power Delivery	17,322,483.40	(0.98)		12,179,786.09	29,502,268.51
Q4 2018					
Oct 2018					
100 Org Effectiveness				110,184.43	110,184.43
110 Central Progs Srvcs	54.29			4,874,192.60	4,874,246.89
110 Regional Srvcs				575,424.67	575,424.67
Corporate Governance DiscOps	1,267.61	36,070.18		4,856,928.29	4,894,266.08
DEC Central Programs Services				108,359.62	108,359.62
DEC Coal Combustion Products				750.00	750.00
DEC Customer	-	18,479.59		281,460.30	299,939.89
DEC Customer Experience	778.65	81,345.19		188,147.04	270,270.88
DEC Environmental	20.54	-		122,054.55	122,075.09
DEC Fleet Maint Srvcs				4,395.68	4,395.68
DEC Fossil Hydro		871.20		9,588.64	10,459.84
DEC Gen Ops Support				250.00	250.00
DEC Nuclear	723.19	2,074.20		50,149.31	52,946.70
DEC Org Effectiveness				6,132.60	6,132.60

DEC Other	53.37	(4,764.94)		44,257.10	39,545.53
DEC Other Misc	328.46	54,903.98		43,607.71	98,840.15
DEC Power Delivery	897.28	30,130.97		1,229,905.06	1,260,933.31
DEC Regional Srvcs				76,848.26	76,848.26
DEC Whlsale Pwr & Rnwable Gen	267.13	35,783.81		25,604.18	61,655.12
DEF Fossil Hydro				2,000.00	2,000.00
DEF Other	3,120.92	492.26		274,157.01	277,770.19
DEF Power Delivery	7,996.92	177.08		263,538.42	271,712.42
DEF President & Staff				1,660.05	1,660.05
DEF Regional Srvcs				153.17	153.17
DEF Retail	4.19			37,121.92	37,126.11
DEI Customer				664.96	664.96
DEI Fossil Hydro				601.02	601.02
DEI Power Delivery	7,447.84	-		86,779.07	94,226.91
DEK Fossil				918.05	918.05
DEK Power Delivery				(6,173.79)	(6,173.79)
DEP Central Progs Srvcs				55,575.36	55,575.36
DEP Environmental	35.16	-		285.62	320.78
DEP Fossil Hydro				200,726.38	200,726.38
DEP Gen Ops Support				27,025.41	27,025.41
DEP Nuclear	12.54			1,119.96	1,132.50
DEP Other				4,225.62	4,225.62
DEP Power Delivery	48.21	2,728.65		333,381.89	336,158.75
DEP Retail	0.82			13,021.61	13,022.43
Duke Energy Ohio - Com Power				733.89	733.89
Duke Energy Ohio - RU				86,739.99	86,739.99
Marketing & Customer Engagemen				37,395.25	37,395.25
Piedmont Gas - Customer				5,806.31	5,806.31
Piedmont Gas - Delivery	264.81	5,130.46		210,895.58	216,290.85
Piedmont Gas - Other				111,139.58	111,139.58
SrvCo Construct & Proj Mgmt	130.70	20,093.36		458,667.38	478,891.44
Srvco Customer Service	82.60	578.51		13,088,621.68	13,089,282.79
SrvCo Enterprise Business Svs	1,269,193.86	9,552,803.52	-	152,288,273.26	163,110,270.64

SrvCo EnviroHealthSafety	32,457.90	26,922.00	8,770,838.80	8,830,218.70
SrvCo Fossil Hydro Total	1,578.10		323,365.48	324,943.58
SrvCo Gas			180,021.55	180,021.55
SrvCo Gen Support	322,952.90		4,617,311.14	4,940,264.04
SrvCo Nuclear			61,430.25	61,430.25
SrvCo Other	23,991.60	105,912.05	16,864,348.24	16,994,251.89
SrvCo Power Delivery	19,166,690.24	117.41	13,579,964.38	32,746,772.03
Nov 2018				
100 Org Effectiveness			117,985.34	117,985.34
110 Central Progs Srvcs	236.40		5,319,459.25	5,319,695.65
110 Regional Srvcs			632,471.38	632,471.38
Corporate Governance DiscOps	1,267.61	43,155.36	6,183,871.92	6,228,294.89
DE Renewables & Transmission			6,527.74	6,527.74
DEC Central Programs Services			23,766.84	23,766.84
DEC Coal Combustion Products			750.00	750.00
DEC Customer	-	26,151.23	337,729.21	363,880.44
DEC Customer Experience	778.65	92,470.78	205,980.49	299,229.92
DEC Environmental	20.54	-	133,350.07	133,370.61
DEC Fleet Maint Srvcs			4,395.68	4,395.68
DEC Fossil Hydro		871.20	4,135.44	5,006.64
DEC Gen Ops Support			250.00	250.00
DEC Nuclear	723.19	2,074.20	54,260.23	57,057.62
DEC Org Effectiveness			6,132.60	6,132.60
DEC Other	53.37	(4,764.94)	48,206.50	43,494.93
DEC Other Misc	328.46	61,324.76	46,217.53	107,870.75
DEC Power Delivery	897.28	30,130.87	1,338,421.39	1,369,449.54
DEC President & Staff			2,418.40	2,418.40
DEC Regional Srvcs			90,864.83	90,864.83
DEC Whlsale Pwr & Rnwable Gen	267.13	39,343.33	28,003.12	67,613.58
DEF Fossil Hydro			2,000.00	2,000.00
DEF Other	3,120.92	1,316.72	303,616.20	308,053.84
DEF Power Delivery	7,996.92	177.07	291,091.80	299,265.79
DEF President & Staff			1,660.05	1,660.05

DEF Regional Srvcs				3,552.82	3,552.82
DEF Retail	4.19			42,905.04	42,909.23
DEI Customer				664.96	664.96
DEI Fossil Hydro				601.02	601.02
DEI Power Delivery	7,447.84	-		104,187.76	111,635.60
DEK Fossil				918.05	918.05
DEK Power Delivery				(6,173.79)	(6,173.79)
DEP Central Progs Srvcs		486.70		59,663.61	60,150.31
DEP Environmental	35.16	-		285.62	320.78
DEP Fossil Hydro				221,663.93	221,663.93
DEP Gen Ops Support				27,025.41	27,025.41
DEP Nuclear	12.54			1,119.96	1,132.50
DEP Other				10,844.70	10,844.70
DEP Power Delivery	48.21	2,728.63		374,259.47	377,036.31
DEP Regional Srvcs				5,861.48	5,861.48
DEP Retail	0.82			13,562.78	13,563.60
Duke Energy Ohio - Com Power				733.89	733.89
Duke Energy Ohio - RU		0.03		96,209.66	96,209.69
Marketing & Customer Engagemen		-		40,691.80	40,691.80
Piedmont Gas - Customer				6,341.10	6,341.10
Piedmont Gas - Delivery	264.81	9,352.10		229,700.89	239,317.80
Piedmont Gas - Other				116,610.10	116,610.10
SrvCo Construct & Proj Mgmt	130.70	20,093.36		508,311.18	528,535.24
Srvco Customer Service	82.60	635.88		14,329,681.03	14,330,399.51
SrvCo Enterprise Business Svs	1,311,594.84	10,461,492.05	-	166,184,876.65	177,957,963.54
SrvCo EnviroHealthSafety	34,670.16	32,479.04		9,548,625.44	9,615,774.64
SrvCo Fossil Hydro Total	2,734.04			353,415.24	356,149.28
SrvCo Gas				187,748.53	187,748.53
SrvCo Gen Support	471,038.53			4,926,655.55	5,397,694.08
SrvCo Nuclear				67,308.73	67,308.73
SrvCo Other	23,991.60	122,248.95		18,362,894.57	18,509,135.12
SrvCo Power Delivery	21,052,405.04	1,597.37		14,929,108.12	35,983,110.53
Dec 2018					

100 Org Effectiveness			126,405.36	126,405.36
110 Central Progs Srvcs	236.40		5,638,884.69	5,639,121.09
110 Regional Srvcs			674,630.30	674,630.30
Corporate Governance DiscOps	1,583.01	76,622.98	7,083,124.47	7,161,330.46
DE Renewables & Transmission			9,911.98	9,911.98
DEC Central Programs Services			41,882.34	41,882.34
DEC Coal Combustion Products			750.00	750.00
DEC Customer	76.33	28,850.62	327,458.36	356,385.31
DEC Customer Experience	943.08	97,677.09	221,525.03	320,145.20
DEC Environmental	20.54	-	144,099.01	144,119.55
DEC Fleet Maint Srvcs			4,395.68	4,395.68
DEC Fossil Hydro		871.20	9,476.99	10,348.19
DEC Gen Ops Support			1,250.00	1,250.00
DEC Nuclear	783.80	2,074.20	56,875.13	59,733.13
DEC Org Effectiveness			6,132.60	6,132.60
DEC Other	53.37	(4,764.94)	51,984.92	47,273.35
DEC Other Misc	378.64	65,512.96	48,090.63	113,982.23
DEC Power Delivery	911.75	121,582.45	1,429,361.24	1,551,855.44
DEC President & Staff			6,567.44	6,567.44
DEC Regional Srvcs			94,861.43	94,861.43
DEC Whlsale Pwr & Rnwable Gen	316.80	42,437.14	29,721.81	72,475.75
DEF Fossil Hydro			2,545.50	2,545.50
DEF Other	3,717.38	1,917.78	326,702.42	332,337.58
DEF Power Delivery	8,613.65	177.06	306,155.71	314,946.42
DEF President & Staff			1,660.05	1,660.05
DEF Regional Srvcs			3,552.82	3,552.82
DEF Retail	4.19		38,412.08	38,416.27
DEI Customer			664.96	664.96
DEI Fossil Hydro			601.02	601.02
DEI Power Delivery	7,460.49	-	96,213.26	103,673.75
DEK Fossil			918.05	918.05
DEK Power Delivery			(6,173.79)	(6,173.79)
DEP Central Progs Srvcs		486.70	62,289.77	62,776.47

DEP Environmental	35.16	-		7,785.62	7,820.78
DEP Fossil Hydro				232,971.60	232,971.60
DEP Gen Ops Support				27,025.41	27,025.41
DEP Nuclear	12.54			1,119.96	1,132.50
DEP Other				-	-
DEP Power Delivery	105.30	4,396.83		339,587.56	344,089.69
DEP Regional Srvcs				5,861.48	5,861.48
DEP Retail	0.82			13,182.09	13,182.91
Duke Energy Ohio - Com Power				733.89	733.89
Duke Energy Ohio - RU		1,789.63		104,457.84	106,247.47
Marketing & Customer Engagemen		6,000.08		43,047.62	49,047.70
Piedmont Gas - Customer				6,341.10	6,341.10
Piedmont Gas - Delivery	465.44	9,352.10		242,673.19	252,490.73
Piedmont Gas - Other	116.76			122,164.42	122,281.18
SrvCo Construct & Proj Mgmt	160.96	20,093.36		550,992.48	571,246.80
Srvco Customer Service	83.30	218,777.19		15,252,692.91	15,471,553.40
SrvCo Enterprise Business Svs	1,463,867.64	12,627,208.62	-	176,639,591.91	190,730,668.17
SrvCo EnviroHealthSafety	36,750.95	35,320.61		10,219,679.90	10,291,751.46
SrvCo Fossil Hydro Total	2,734.04			369,851.22	372,585.26
SrvCo Gas				197,125.93	197,125.93
SrvCo Gen Support	16,846.96			5,760,943.79	5,777,790.75
SrvCo Nuclear				71,580.07	71,580.07
SrvCo Other	27,395.19	184,137.89		19,694,503.36	19,906,036.44
SrvCo Power Delivery	22,636,363.44	3,421.21		16,078,071.84	38,717,856.49
Grand Total	**24,210,037.93**	**13,543,942.76**	**-**	**262,822,916.45**	**300,576,897.14**

Actual - 12 months ending December 2017 **See second query for department detail**

Business Unit Hierarchy **Duke Energy Kentucky Electric**

	ASSET - Assets	CAPITAL - Capital	INDIRECT - Indirect	O&M and Other Expenses	Grand Total
Q1 2017					
Jan 2017	$ 1,633,736.43	$ 484,922.31	$ 12,095.93	$ 17,666,589.80	$ 19,797,344.47
Feb 2017	3,773,878.79	1,152,680.78	20,704.83	36,296,549.93	41,243,814.33
Mar 2017	6,547,338.44	2,071,610.11	9,226.76	56,812,431.37	65,440,606.68
Q2 2017					
Apr 2017	8,462,689.77	2,784,686.84	9,226.76	75,621,015.41	86,877,618.78
May 2017	10,433,428.10	3,699,972.84	9,226.76	94,832,180.12	108,974,807.82
Jun 2017	12,315,695.89	4,549,342.02	9,226.76	114,532,845.61	131,407,110.28
Q3 2017					
Jul 2017	14,164,196.16	5,215,870.54	9,226.76	131,811,631.00	151,200,924.46
Aug 2017	16,265,801.93	6,030,692.41	12,226.76	151,028,143.15	173,336,864.25
Sep 2017	18,156,348.27	6,805,857.69	12,226.76	171,317,958.52	196,292,391.24
Q4 2017					
Oct 2017	20,689,282.93	7,680,608.98	12,226.76	191,815,429.03	220,197,547.70
Nov 2017	22,276,520.88	8,321,915.77	-	211,398,767.15	241,997,203.80
Dec 2017	23,879,133.25	9,785,562.68	-	224,518,155.59	258,182,851.52
Grand Total	**$ 23,879,133.25**	**$ 9,785,562.68**	**$ -**	**$224,518,155.59**	**$258,182,851.52**

Business Unit Hierarchy **Duke Energy Kentucky Electric**

	ASSET - Assets	CAPITAL - Capital	INDIRECT - Indirect	O&M and Other Expenses	Grand Total
Q1 2017					
Jan 2017					
100 Org Effectiveness				$ 42,791.89	$ 42,791.89
110 Central Progs Srvcs				399,649.14	399,649.14

110 Regional Srvcs				72,039.34	72,039.34
Corporate Governance DiscOps	132.94			(330,025.56)	(329,892.62)
DE Renewables & Transmission				557.75	557.75
DEC Central Programs Services				23,583.25	23,583.25
DEC Customer	(47.66)			26,363.54	26,315.88
DEC Customer Experience				2,059.90	2,059.90
DEC Environmental				17,677.09	17,677.09
DEC Fossil Hydro				1,334.78	1,334.78
DEC Gen Ops Support				211.38	211.38
DEC Nuclear	23.59			2,204.74	2,228.33
DEC Other		(0.01)		25,607.50	25,607.49
DEC Other Misc				4,397.67	4,397.67
DEC Power Delivery	22.30	-		151,035.85	151,058.15
DEF Other	(38.86)			(11,373.38)	(11,412.24)
DEF Power Delivery	534.09	(493.85)		(29,561.75)	(29,521.51)
DEI Power Delivery		(0.01)		64.82	64.81
DEP Central Progs Srvcs				5,229.88	5,229.88
DEP Environmental				876.33	876.33
DEP Fossil Hydro				(4,281.06)	(4,281.06)
DEP Gen Ops Support				44,313.54	44,313.54
DEP Nuclear				25,769.68	25,769.68
DEP Org Effectiveness				11,646.18	11,646.18
DEP Power Delivery	4.03	(0.01)		12,716.40	12,720.42
Piedmont Gas - Other				13,908.47	13,908.47
SrvCo Construct & Proj Mgmt	8.52			44,302.02	44,310.54
Srvco Customer Service	112.07	-		901,585.67	901,697.74
SrvCo Enterprise Business Svs	103,425.61	473,021.29	12,095.93	12,600,027.09	13,188,569.92
SrvCo EnviroHealthSafety	2,061.70			895,961.13	898,022.83
SrvCo Fossil Hydro Total				9,935.78	9,935.78
SrvCo Gen Support	71,046.68			201,596.78	272,643.46
SrvCo Nuclear				21,777.80	21,777.80
SrvCo Other	2,627.48	539.55		1,442,722.83	1,445,889.86
SrvCo Power Delivery	1,453,823.94	11,855.35		1,039,883.33	2,505,562.62

Feb 2017				
100 Org Effectiveness			88,813.22	88,813.22
110 Central Progs Srvcs			808,358.22	808,358.22
110 Regional Srvcs			135,626.54	135,626.54
Corporate Governance DiscOps	246.50		(634,408.31)	(634,161.81)
DE Renewables & Transmission			557.75	557.75
DEC Central Programs Services			39,964.92	39,964.92
DEC Customer	(47.66)	5,550.00	42,846.38	48,348.72
DEC Customer Experience		2,524.82	6,973.84	9,498.66
DEC Environmental			34,499.11	34,499.11
DEC Fossil Hydro			3,546.53	3,546.53
DEC Gen Ops Support			287.80	287.80
DEC Nuclear	84.52		6,698.35	6,782.87
DEC Org Effectiveness			983.18	983.18
DEC Other		(0.01)	54,565.93	54,565.92
DEC Other Misc			4,397.67	4,397.67
DEC Power Delivery	110.69	0.01	276,400.63	276,511.33
DEF Other	197.92		7,394.00	7,591.92
DEF Power Delivery	2,857.38	(493.85)	(32,471.96)	(30,108.43)
DEI Customer	2.92		283.62	286.54
DEI Power Delivery	7.63	-	3,211.86	3,219.49
DEP Central Progs Srvcs			10,771.18	10,771.18
DEP Environmental			4,471.53	4,471.53
DEP Fossil Hydro			(4,281.06)	(4,281.06)
DEP Gen Ops Support			83,495.10	83,495.10
DEP Nuclear			25,769.68	25,769.68
DEP Org Effectiveness			23,827.80	23,827.80
DEP Power Delivery	8.23	(0.01)	27,074.17	27,082.39
DEP Regional Srvcs			407.70	407.70
DEP Retail			(250.00)	(250.00)
Piedmont Gas - Delivery		3,817.31	259.62	4,076.93
Piedmont Gas - Other		763.46	56,231.61	56,995.07
SrvCo Construct & Proj Mgmt	19.60		94,953.94	94,973.54

Srvco Customer Service	232.86	(0.02)		1,920,811.04	1,921,043.88
SrvCo Enterprise Business Svs	221,139.94	1,124,786.42	20,704.83	25,710,304.16	27,076,935.35
SrvCo EnviroHealthSafety	4,491.64	4,255.45		1,884,564.97	1,893,312.06
SrvCo Fossil Hydro Total				21,610.08	21,610.08
SrvCo Gen Support	149,046.88			436,344.77	585,391.65
SrvCo Nuclear				44,471.52	44,471.52
SrvCo Other	5,175.56	7,086.63		2,988,145.40	3,000,407.59
SrvCo Power Delivery	3,390,304.18	4,390.57		2,119,037.44	5,513,732.19
Mar 2017					
100 Org Effectiveness				139,990.54	139,990.54
110 Central Progs Srvcs				1,220,323.43	1,220,323.43
110 Regional Srvcs				205,996.30	205,996.30
Corporate Governance DiscOps	354.17			(883,212.21)	(882,858.04)
DE Renewables & Transmission				557.75	557.75
DEC Central Programs Services				56,816.00	56,816.00
DEC Customer	(47.66)	5,550.00		24,148.91	29,651.25
DEC Customer Experience		2,524.82		7,612.90	10,137.72
DEC Environmental				51,803.34	51,803.34
DEC Fossil Hydro				4,010.19	4,010.19
DEC Gen Ops Support				287.80	287.80
DEC Nuclear	196.53			17,606.03	17,802.56
DEC Org Effectiveness				5,044.15	5,044.15
DEC Other		(0.01)		99,429.39	99,429.38
DEC Other Misc				5,647.67	5,647.67
DEC Power Delivery	(285.26)	(0.01)		380,696.11	380,410.84
DEF Other	623.04			45,907.26	46,530.30
DEF Power Delivery	1,753.22	(493.85)		(76,623.27)	(75,363.90)
DEF Retail				(1,385.97)	(1,385.97)
DEI Customer	2.92			283.62	286.54
DEI Power Delivery	8,291.12	-		9,075.23	17,366.35
DEP Central Progs Srvcs				16,206.08	16,206.08
DEP Environmental				9,369.99	9,369.99
DEP Fossil Hydro				(4,281.06)	(4,281.06)

DEP Gen Ops Support				121,357.51	121,357.51
DEP Nuclear				25,769.68	25,769.68
DEP Org Effectiveness				36,009.42	36,009.42
DEP Power Delivery	14.62	(0.03)		45,793.11	45,807.70
DEP Regional Srvcs				407.70	407.70
DEP Retail				(250.00)	(250.00)
Marketing & Customer Engagemen				(5,839.00)	(5,839.00)
Piedmont Gas - Delivery		11,618.39		34,934.57	46,552.96
Piedmont Gas - Other		1,950.27		120,889.53	122,839.80
SrvCo Construct & Proj Mgmt	31.54			148,722.53	148,754.07
Srvco Customer Service	382.66	(0.03)		3,198,479.43	3,198,862.06
SrvCo Enterprise Business Svs	350,903.65	1,995,207.62	9,226.76	39,954,182.01	42,309,520.04
SrvCo EnviroHealthSafety	7,587.77	37,527.52		2,873,688.00	2,918,803.29
SrvCo Fossil Hydro Total				33,792.14	33,792.14
SrvCo Gen Support	89,448.36			825,350.88	914,799.24
SrvCo Nuclear				67,623.76	67,623.76
SrvCo Other	8,088.42	13,311.07		4,669,147.88	4,690,547.37
SrvCo Power Delivery	6,079,993.34	4,414.35		3,327,062.04	9,411,469.73
Q2 2017					
Apr 2017					
100 Org Effectiveness				192,781.30	192,781.30
110 Central Progs Srvcs				1,605,058.76	1,605,058.76
110 Regional Srvcs				276,784.12	276,784.12
Corporate Governance DiscOps	443.24			170,459.29	170,902.53
DE Renewables & Transmission				557.75	557.75
DEC Central Programs Services				77,612.89	77,612.89
DEC Customer	(47.66)	6,050.00		32,559.29	38,561.63
DEC Customer Experience		2,524.82		8,550.42	11,075.24
DEC Environmental				74,324.64	74,324.64
DEC Fossil Hydro				5,812.97	5,812.97
DEC Gen Ops Support				287.80	287.80
DEC Nuclear	315.20			29,971.59	30,286.79
DEC Org Effectiveness				5,044.15	5,044.15

DEC Other		(0.02)		126,655.22	126,655.20
DEC Other Misc				5,647.67	5,647.67
DEC Power Delivery	(276.89)	860.19		451,823.31	452,406.61
DEF Other	513.27	260.70		35,976.77	36,750.74
DEF Power Delivery	2,217.98	(493.85)		(59,022.31)	(57,298.18)
DEF Retail				(1,391.11)	(1,391.11)
DEI Customer	2.92			283.62	286.54
DEI Fossil Hydro				747.30	747.30
DEI Power Delivery	13,810.30	-		17,616.06	31,426.36
DEP Central Progs Srvcs				20,331.91	20,331.91
DEP Environmental				12,875.31	12,875.31
DEP Fossil Hydro				(4,281.06)	(4,281.06)
DEP Gen Ops Support				163,973.87	163,973.87
DEP Nuclear				25,769.68	25,769.68
DEP Org Effectiveness				36,009.42	36,009.42
DEP Power Delivery	18.07	(0.03)		62,736.60	62,754.64
DEP Regional Srvcs				407.70	407.70
DEP Retail				(219.57)	(219.57)
Marketing & Customer Engagemen				(5,231.55)	(5,231.55)
Piedmont Gas - Delivery		18,639.38		76,549.37	95,188.75
Piedmont Gas - Other		1,755.26		163,254.83	165,010.09
SrvCo Construct & Proj Mgmt	41.34			197,926.09	197,967.43
Srvco Customer Service	480.97	(0.04)		4,188,205.37	4,188,686.30
SrvCo Enterprise Business Svs	461,080.56	2,692,912.74	9,226.76	52,118,912.97	55,282,133.03
SrvCo EnviroHealthSafety	9,812.47	41,146.49		3,787,548.89	3,838,507.85
SrvCo Fossil Hydro Total				33,792.14	33,792.14
SrvCo Gas				346.88	346.88
SrvCo Gen Support	140,548.24			989,724.94	1,130,273.18
SrvCo Nuclear				89,035.55	89,035.55
SrvCo Other	10,565.32	16,616.89		6,190,636.10	6,217,818.31
SrvCo Power Delivery	7,823,164.44	4,414.31		4,414,568.47	12,242,147.22
May 2017					
100 Org Effectiveness				252,812.98	252,812.98

110 Central Progs Srvcs			2,043,453.45	2,043,453.45
110 Regional Srvcs			350,553.04	350,553.04
Corporate Governance DiscOps	546.59	48.09	1,253,854.40	1,254,449.08
DE Renewables & Transmission			557.75	557.75
DEC Central Programs Services			98,040.89	98,040.89
DEC Customer	(47.66)	6,050.00	35,641.66	41,644.00
DEC Customer Experience		2,524.82	9,714.61	12,239.43
DEC Environmental			87,820.38	87,820.38
DEC Fossil Hydro			9,049.86	9,049.86
DEC Gen Ops Support			287.80	287.80
DEC Nuclear	364.19		34,549.35	34,913.54
DEC Org Effectiveness			5,044.15	5,044.15
DEC Other		(0.02)	152,213.76	152,213.74
DEC Other Misc			4,397.67	4,397.67
DEC Power Delivery	(266.28)	5,556.04	522,911.04	528,200.80
DEC Whlsale Pwr & Rnwable Gen	13.31		1,292.62	1,305.93
DEF Gen Ops Support			1,500.00	1,500.00
DEF Other	805.65	260.70	62,754.02	63,820.37
DEF Power Delivery	2,223.20	(493.85)	(57,787.70)	(56,058.35)
DEF Retail			(1,391.11)	(1,391.11)
DEI Customer	2.92		283.62	286.54
DEI Fossil Hydro			747.30	747.30
DEI Power Delivery	16,787.44	0.01	27,742.51	44,529.96
DEP Central Progs Srvcs			25,761.43	25,761.43
DEP Environmental			15,212.19	15,212.19
DEP Fossil Hydro			(4,281.06)	(4,281.06)
DEP Gen Ops Support			206,652.32	206,652.32
DEP Nuclear			25,769.68	25,769.68
DEP Org Effectiveness			36,009.42	36,009.42
DEP Power Delivery	37.47	(0.03)	90,619.38	90,656.82
DEP Regional Srvcs			407.70	407.70
DEP Retail			(219.57)	(219.57)
Marketing & Customer Engagemen			(4,612.58)	(4,612.58)

Piedmont Gas - Customer				612.86	612.86
Piedmont Gas - Delivery		25,660.36		118,679.52	144,339.88
Piedmont Gas - Other		2,808.39		245,146.35	247,954.74
SrvCo Construct & Proj Mgmt	52.52			249,169.26	249,221.78
Srvco Customer Service	274.89	30,109.91		5,190,179.12	5,220,563.92
SrvCo Enterprise Business Svs	562,840.59	3,559,572.77	9,226.76	64,448,927.45	68,580,567.57
SrvCo EnviroHealthSafety	12,907.10	45,651.58		4,705,671.47	4,764,230.15
SrvCo Fossil Hydro Total				33,792.14	33,792.14
SrvCo Gas				1,272.64	1,272.64
SrvCo Gen Support	202,734.43			1,178,161.33	1,380,895.76
SrvCo Nuclear				108,002.76	108,002.76
SrvCo Other	12,930.69	17,809.86		7,779,230.55	7,809,971.10
SrvCo Power Delivery	9,621,221.05	4,414.21		5,485,971.71	15,111,606.97
Jun 2017					
100 Org Effectiveness				321,801.92	321,801.92
110 Central Progs Srvcs				2,514,909.10	2,514,909.10
110 Regional Srvcs				431,685.85	431,685.85
Corporate Governance DiscOps	617.83	48.09		2,374,557.00	2,375,222.92
DE Renewables & Transmission				557.75	557.75
DEC Central Programs Services				119,258.68	119,258.68
DEC Customer	(47.66)	16.72		7,141.28	7,110.34
DEC Customer Experience		2,990.14		5,707.14	8,697.28
DEC Environmental				107,691.93	107,691.93
DEC Fossil Hydro				12,034.91	12,034.91
DEC Gen Ops Support				287.80	287.80
DEC Nuclear	407.05			38,921.04	39,328.09
DEC Org Effectiveness				5,044.15	5,044.15
DEC Other		(0.03)		178,883.50	178,883.47
DEC Other Misc				4,397.67	4,397.67
DEC Power Delivery	(253.87)	7,631.43		584,241.59	591,619.15
DEC Whlsale Pwr & Rnwable Gen	73.34			7,120.40	7,193.74
DEF Gen Ops Support				1,500.00	1,500.00
DEF Other	1,025.77	260.70		82,720.25	84,006.72

DEF Power Delivery	3,318.20	(493.85)		(56,594.86)	(53,770.51)
DEF Retail				(1,391.11)	(1,391.11)
DEI Customer	2.92			283.62	286.54
DEI Fossil Hydro				747.30	747.30
DEI Power Delivery	18,257.79	0.01		47,347.87	65,605.67
DEP Central Progs Srvcs				31,452.29	31,452.29
DEP Environmental				15,212.19	15,212.19
DEP Fossil Hydro				6,237.63	6,237.63
DEP Gen Ops Support				246,694.66	246,694.66
DEP Nuclear				25,769.68	25,769.68
DEP Org Effectiveness				36,009.42	36,009.42
DEP Power Delivery	41.81	2,062.95		130,102.90	132,207.66
DEP Regional Srvcs				407.70	407.70
DEP Retail				(219.57)	(219.57)
Marketing & Customer Engagemen				(4,897.03)	(4,897.03)
Piedmont Gas - Customer				1,293.91	1,293.91
Piedmont Gas - Delivery		32,681.35		163,778.08	196,459.43
Piedmont Gas - Other		3,510.45		476,130.26	479,640.71
SrvCo Construct & Proj Mgmt	62.58			291,769.76	291,832.34
Srvco Customer Service	381.79	36,159.90		6,130,709.05	6,167,250.74
SrvCo Enterprise Business Svs	671,753.04	4,387,200.15	9,226.76	77,154,154.06	82,222,334.01
SrvCo EnviroHealthSafety	16,180.03	53,276.35		5,599,597.30	5,669,053.68
SrvCo Fossil Hydro Total				33,792.14	33,792.14
SrvCo Gas				2,387.90	2,387.90
SrvCo Gen Support	264,880.18			1,379,584.79	1,644,464.97
SrvCo Nuclear				127,924.05	127,924.05
SrvCo Other	14,849.84	19,583.51		9,349,808.10	9,384,241.45
SrvCo Power Delivery	11,324,145.25	4,414.15		6,546,291.56	17,874,850.96
Q3 2017					
Jul 2017					
100 Org Effectiveness				377,080.70	377,080.70
110 Central Progs Srvcs				2,960,025.76	2,960,025.76
110 Regional Srvcs				511,546.84	511,546.84

Corporate Governance DiscOps	714.35	48.09	2,222,821.67	2,223,584.11
DE Renewables & Transmission			557.75	557.75
DEC Central Programs Services			137,295.33	137,295.33
DEC Customer	(82.42)	6,124.36	18,352.65	24,394.59
DEC Customer Experience		3,686.58	6,375.72	10,062.30
DEC Environmental			123,189.46	123,189.46
DEC Fossil Hydro			13,525.15	13,525.15
DEC Gen Ops Support			287.80	287.80
DEC Nuclear	432.26		41,043.46	41,475.72
DEC Org Effectiveness			5,044.15	5,044.15
DEC Other		(0.03)	182,227.50	182,227.47
DEC Other Misc			4,397.67	4,397.67
DEC Power Delivery	(242.82)	13,275.48	634,016.34	647,049.00
DEC Regional Srvcs			347.58	347.58
DEC Whlsale Pwr & Rnwable Gen	128.77		12,501.51	12,630.28
DEF Gen Ops Support			1,500.00	1,500.00
DEF Other	1,284.24	260.70	106,221.00	107,765.94
DEF Power Delivery	3,321.04	(493.85)	(55,611.21)	(52,784.02)
DEF Retail			(1,160.14)	(1,160.14)
DEI Customer	2.92		283.62	286.54
DEI Fossil Hydro			1,213.70	1,213.70
DEI Power Delivery	19,531.80	0.01	66,353.23	85,885.04
DEP Central Progs Srvcs			36,822.92	36,822.92
DEP Environmental		747.60	15,212.19	15,959.79
DEP Fossil Hydro			19,694.49	19,694.49
DEP Gen Ops Support			278,385.85	278,385.85
DEP Nuclear			25,769.68	25,769.68
DEP Org Effectiveness			68,042.93	68,042.93
DEP Power Delivery	44.80	5,889.52	158,796.33	164,730.65
DEP Regional Srvcs			407.70	407.70
DEP Retail			(504.02)	(504.02)
Marketing & Customer Engagemen			(4,682.56)	(4,682.56)
Piedmont Gas - Customer			8,616.78	8,616.78

Piedmont Gas - Delivery		60,042.77		280,649.49	340,692.26
Piedmont Gas - Other		2,048.64		641,570.76	643,619.40
SrvCo Construct & Proj Mgmt	73.80			332,393.72	332,467.52
Srvco Customer Service	485.16	30,249.61		7,139,241.26	7,169,976.03
SrvCo Enterprise Business Svs	775,421.39	5,008,264.63	9,226.76	89,008,933.87	94,801,846.65
SrvCo EnviroHealthSafety	19,851.53	61,567.80		6,424,830.82	6,506,250.15
SrvCo Fossil Hydro Total				34,520.96	34,520.96
SrvCo Gas	7.73			8,393.30	8,401.03
SrvCo Gen Support	345,154.89			1,597,571.98	1,942,726.87
SrvCo Nuclear				145,198.51	145,198.51
SrvCo Other	15,469.73	19,596.01		10,684,133.88	10,719,199.62
SrvCo Power Delivery	12,982,596.99	4,562.62		7,538,192.92	20,525,352.53
Aug 2017					
100 Org Effectiveness				443,191.45	443,191.45
110 Central Progs Srvcs	48.31			3,507,478.69	3,507,527.00
110 Regional Srvcs				604,953.02	604,953.02
Corporate Governance DiscOps	776.36	48.09		2,085,293.04	2,086,117.49
DE Renewables & Transmission				557.75	557.75
DEC Central Programs Services				156,598.40	156,598.40
DEC Customer	(82.42)	7,218.16		20,760.32	27,896.06
DEC Customer Experience		7,782.51		11,234.12	19,016.63
DEC Environmental		927.08		138,669.52	139,596.60
DEC Fossil Hydro				27,412.81	27,412.81
DEC Gen Ops Support				287.80	287.80
DEC Nuclear	528.64			50,051.36	50,580.00
DEC Org Effectiveness				5,044.15	5,044.15
DEC Other		(0.03)		105,325.39	105,325.36
DEC Other Misc				4,397.67	4,397.67
DEC Power Delivery	(216.88)	24,959.67		673,028.22	697,771.01
DEC Regional Srvcs				1,006.74	1,006.74
DEC Whlsale Pwr & Rnwable Gen	185.21			17,980.62	18,165.83
DEF Gen Ops Support				1,500.00	1,500.00
DEF Other	1,546.29	897.82		130,054.13	132,498.24

DEF Power Delivery	3,926.21	(493.85)		(53,528.24)	(50,095.88)
DEF Retail				(1,160.14)	(1,160.14)
DEI Customer	2.92			283.62	286.54
DEI Fossil Hydro				1,446.90	1,446.90
DEI Power Delivery	20,922.57	0.01		93,201.11	114,123.69
DEK Power Delivery	2.15			5,251.65	5,253.80
DEP Central Progs Srvcs				41,160.19	41,160.19
DEP Environmental		2,692.34		16,141.79	18,834.13
DEP Fossil Hydro				53,453.50	53,453.50
DEP Gen Ops Support				319,514.74	319,514.74
DEP Nuclear				25,769.68	25,769.68
DEP Org Effectiveness				68,042.93	68,042.93
DEP Power Delivery	53.17	15,630.82		193,200.89	208,884.88
DEP Regional Srvcs				407.70	407.70
DEP Retail				(504.02)	(504.02)
Duke Energy Ohio - RU				1,000.00	1,000.00
Marketing & Customer Engagemen				(4,209.00)	(4,209.00)
Piedmont Gas - Customer				7,857.54	7,857.54
Piedmont Gas - Delivery		68,534.59		311,674.46	380,209.05
Piedmont Gas - Other	5.63	7,132.98		732,324.23	739,462.84
SrvCo Construct & Proj Mgmt	86.65			378,072.17	378,158.82
Srvco Customer Service	592.87	30,345.72		8,329,460.82	8,360,399.41
SrvCo Enterprise Business Svs	882,302.67	5,771,020.02	9,226.76	102,094,399.69	108,756,949.14
SrvCo EnviroHealthSafety	24,722.45	69,544.29		7,341,032.88	7,435,299.62
SrvCo Fossil Hydro Total				34,606.90	34,606.90
SrvCo Gas	7.32			9,114.87	9,122.19
SrvCo Gen Support	461,602.73			1,900,823.69	2,362,426.42
SrvCo Nuclear				158,650.47	158,650.47
SrvCo Other	17,537.41	19,749.93		12,288,681.99	12,325,969.33
SrvCo Power Delivery	14,851,251.67	4,702.26	3,000.00	8,697,144.94	23,556,098.87
Sep 2017					
100 Org Effectiveness				501,058.42	501,058.42
110 Central Progs Srvcs	52.76	174.76		4,169,991.92	4,170,219.44

110 Regional Srvcs			685,282.71	685,282.71
Corporate Governance DiscOps	824.99	5,062.37	2,327,062.47	2,332,949.83
DE Renewables & Transmission			557.75	557.75
DEC Central Programs Services			175,207.72	175,207.72
DEC Customer	(47.66)	1,917.80	(18,108.38)	(16,238.24)
DEC Customer Experience		9,989.32	13,266.48	23,255.80
DEC Environmental		3,692.64	150,471.82	154,164.46
DEC Fossil Hydro			42,603.59	42,603.59
DEC Gen Ops Support			287.80	287.80
DEC Nuclear	644.78		60,905.47	61,550.25
DEC Org Effectiveness			5,044.15	5,044.15
DEC Other		(0.03)	110,627.39	110,627.36
DEC Other Misc	5.02		4,885.11	4,890.13
DEC Power Delivery	(201.14)	30,265.01	705,512.36	735,576.23
DEC Regional Srvcs			1,006.74	1,006.74
DEC Whlsale Pwr & Rnwable Gen	245.28		23,812.90	24,058.18
DEF Fossil Hydro			433.17	433.17
DEF Gen Ops Support			1,500.00	1,500.00
DEF Other	1,998.43	897.82	171,188.95	174,085.20
DEF Power Delivery	4,303.32	(493.85)	(55,912.79)	(52,103.32)
DEF Retail			(1,437.58)	(1,437.58)
DEI Customer	2.92		283.62	286.54
DEI Fossil Hydro			2,082.90	2,082.90
DEI Power Delivery	26,091.42	0.02	123,468.04	149,559.48
DEK Power Delivery	4.13		10,095.82	10,099.95
DEP Central Progs Srvcs			46,530.87	46,530.87
DEP Environmental		5,685.00	16,141.79	21,826.79
DEP Fossil Hydro			76,494.78	76,494.78
DEP Gen Ops Support	2.07		361,800.60	361,802.67
DEP Nuclear			28,185.09	28,185.09
DEP Org Effectiveness			68,042.93	68,042.93
DEP Power Delivery	60.74	17,522.95	199,994.14	217,577.83
DEP Regional Srvcs			407.70	407.70

DEP Retail				(219.57)	(219.57)
Duke Energy Ohio - RU				1,112.00	1,112.00
Marketing & Customer Engagemen				(5,426.13)	(5,426.13)
Piedmont Gas - Customer				7,857.54	7,857.54
Piedmont Gas - Delivery		89,469.69		420,422.36	509,892.05
Piedmont Gas - Other	22.16	10,737.87		898,493.28	909,253.31
Service Company Alloc Offsets				1,112.25	1,112.25
SrvCo Construct & Proj Mgmt	97.26			429,783.56	429,880.82
Srvco Customer Service	691.30	37,124.41		9,694,946.48	9,732,762.19
SrvCo Enterprise Business Svs	991,779.15	6,492,427.29	9,226.76	115,546,054.83	123,039,488.03
SrvCo EnviroHealthSafety	30,465.67	76,751.35		8,238,991.49	8,346,208.51
SrvCo Fossil Hydro Total				35,122.49	35,122.49
SrvCo Gas	7.32			15,606.28	15,613.60
SrvCo Gen Support	(133,765.93)			2,222,189.87	2,088,423.94
SrvCo Nuclear				165,137.58	165,137.58
SrvCo Other	19,382.05	19,878.42		13,873,895.20	13,913,155.67
SrvCo Power Delivery	17,213,682.23	4,754.85	3,000.00	9,764,102.56	26,985,539.64
Q4 2017					
Oct 2017					
100 Org Effectiveness				563,175.30	563,175.30
110 Central Progs Srvcs	71.01	254.31		4,647,488.92	4,647,814.24
110 Regional Srvcs				768,179.05	768,179.05
Corporate Governance DiscOps	895.54	8,214.32		3,399,314.14	3,408,424.00
DE Renewables & Transmission				557.75	557.75
DEC Central Programs Services				200,556.84	200,556.84
DEC Customer	(47.66)	7,229.01		(5,925.44)	1,255.91
DEC Customer Experience		14,251.82		14,537.69	28,789.51
DEC Environmental		5,256.01		163,304.53	168,560.54
DEC Fossil Hydro				50,304.40	50,304.40
DEC Gen Ops Support				287.80	287.80
DEC Nuclear	742.22			69,245.06	69,987.28
DEC Org Effectiveness				5,044.15	5,044.15
DEC Other		(0.03)		113,949.39	113,949.36

DEC Other Misc	26.86			7,005.46	7,032.32
DEC Power Delivery	(173.68)	37,113.61		724,843.03	761,782.96
DEC Regional Srvcs				1,006.74	1,006.74
DEC Whlsale Pwr & Rnwable Gen	312.38			30,327.13	30,639.51
DEF Fossil Hydro				1,102.96	1,102.96
DEF Gen Ops Support				1,500.00	1,500.00
DEF Other	2,249.97	897.82		194,159.81	197,307.60
DEF Power Delivery	5,745.72	(493.86)		(60,533.79)	(55,281.93)
DEF Retail				(1,437.58)	(1,437.58)
DEI Customer	2.92			283.62	286.54
DEI Fossil Hydro				2,082.90	2,082.90
DEI Power Delivery	27,258.00	(0.01)		154,148.37	181,406.36
DEK Power Delivery	3.10			7,493.60	7,496.70
DEP Central Progs Srvcs				52,221.74	52,221.74
DEP Environmental		9,909.26		19,792.59	29,701.85
DEP Fossil Hydro				101,846.76	101,846.76
DEP Gen Ops Support	2.07			394,143.95	394,146.02
DEP Nuclear				(23,545.17)	(23,545.17)
DEP Org Effectiveness				68,042.93	68,042.93
DEP Power Delivery	61.09	21,184.94		232,261.33	253,507.36
DEP Regional Srvcs				4,088.16	4,088.16
DEP Retail				(219.57)	(219.57)
Duke Energy Ohio - RU				9,545.22	9,545.22
Marketing & Customer Engagemen				(4,780.31)	(4,780.31)
Piedmont Gas - Customer				8,185.12	8,185.12
Piedmont Gas - Delivery		104,355.21		504,913.88	609,269.09
Piedmont Gas - Other	33.84	14,148.04		1,035,268.46	1,049,450.34
Service Company Alloc Offsets				1,112.25	1,112.25
SrvCo Construct & Proj Mgmt	108.35	4,108.11		469,114.16	473,330.62
Srvco Customer Service	797.80	37,124.41		10,751,310.50	10,789,232.71
SrvCo Enterprise Business Svs	1,112,257.45	7,309,011.44	9,226.76	129,309,091.08	137,739,586.73
SrvCo EnviroHealthSafety	34,944.92	83,223.75		9,122,897.66	9,241,066.33
SrvCo Fossil Hydro Total				36,534.59	36,534.59

SrvCo Gas	7.32			19,857.40	19,864.72
SrvCo Gen Support	352,429.40			1,917,668.84	2,270,098.24
SrvCo Nuclear				222,084.28	222,084.28
SrvCo Other	21,248.75	20,066.15		15,579,923.24	15,621,238.14
SrvCo Power Delivery	19,130,305.56	4,754.67	3,000.00	10,932,068.11	30,070,128.34
Nov 2017					
100 Org Effectiveness				610,321.84	610,321.84
110 Central Progs Srvcs	79.36	254.31		5,067,069.05	5,067,402.72
110 Regional Srvcs				828,884.70	828,884.70
Corporate Governance DiscOps	953.73	12,989.79		4,578,517.40	4,592,460.92
DE Renewables & Transmission				557.75	557.75
DEC Central Programs Services				225,101.48	225,101.48
DEC Coal Combustion Products				11,099.56	11,099.56
DEC Customer	(47.66)	10,682.70		(7,434.97)	3,200.07
DEC Customer Experience		14,914.14		16,499.53	31,413.67
DEC Environmental		5,256.01		179,768.89	185,024.90
DEC Fossil Hydro				52,558.73	52,558.73
DEC Gen Ops Support				287.80	287.80
DEC Nuclear	838.14			77,795.81	78,633.95
DEC Org Effectiveness				5,044.15	5,044.15
DEC Other		(0.03)		122,861.70	122,861.67
DEC Other Misc	96.39			13,755.96	13,852.35
DEC Power Delivery	(161.10)	41,163.81		744,440.14	785,442.85
DEC Regional Srvcs				1,006.74	1,006.74
DEC Whlsale Pwr & Rnwable Gen	(2.66)			(259.17)	(261.83)
DEF Fossil Hydro				1,890.46	1,890.46
DEF Gen Ops Support				1,500.00	1,500.00
DEF Other	2,445.82	897.82		211,963.61	215,307.25
DEF Power Delivery	6,366.88	(493.86)		(60,285.05)	(54,412.03)
DEF Retail				(1,437.58)	(1,437.58)
DEI Customer	2.92			283.62	286.54
DEI Fossil Hydro				2,082.90	2,082.90
DEI Power Delivery	28,339.72	-		167,744.53	196,084.25

DEK Fossil				3,204.63	3,204.63
DEK Power Delivery	3.10			7,493.60	7,496.70
DEP Central Progs Srvcs				56,217.79	56,217.79
DEP Environmental		9,909.26		19,792.59	29,701.85
DEP Fossil Hydro				131,229.59	131,229.59
DEP Gen Ops Support	2.07			433,417.92	433,419.99
DEP Nuclear				(49,314.85)	(49,314.85)
DEP Org Effectiveness				68,042.93	68,042.93
DEP Power Delivery	64.98	23,136.88		273,047.05	296,248.91
DEP Regional Srvcs				5,186.39	5,186.39
DEP Retail				(219.57)	(219.57)
Duke Energy Ohio - RU				16,336.32	16,336.32
Marketing & Customer Engagemen				(4,193.11)	(4,193.11)
Piedmont Gas - Customer				8,883.69	8,883.69
Piedmont Gas - Delivery		117,142.72		584,067.87	701,210.59
Piedmont Gas - Other	51.15	18,416.89		1,202,643.19	1,221,111.23
Service Company Alloc Offsets				1,112.25	1,112.25
SrvCo Construct & Proj Mgmt	117.33	16,805.16		505,088.86	522,011.35
Srvco Customer Service	869.93	37,124.36		11,762,359.35	11,800,353.64
SrvCo Enterprise Business Svs	1,207,040.15	7,903,136.79	-	141,802,240.69	150,912,417.63
SrvCo EnviroHealthSafety	39,031.07	84,372.31		9,909,489.03	10,032,892.41
SrvCo Fossil Hydro Total				39,234.59	39,234.59
SrvCo Gas	7.32			21,530.96	21,538.28
SrvCo Gen Support	20,468.42			2,382,904.73	2,403,373.15
SrvCo Nuclear				254,203.23	254,203.23
SrvCo Other	22,948.25	20,225.95		17,088,635.14	17,131,809.34
SrvCo Power Delivery	20,947,005.57	5,980.76	-	12,024,512.71	32,977,499.04
Dec 2017					
100 Org Effectiveness				644,963.29	644,963.29
110 Central Progs Srvcs	83.48	254.31		5,389,892.84	5,390,230.63
110 Regional Srvcs				886,864.58	886,864.58
Corporate Governance DiscOps	993.17	15,927.04		5,550,326.82	5,567,247.03
DE Renewables & Transmission				7,817.43	7,817.43

DEC Central Programs Services			246,687.88	246,687.88
DEC Coal Combustion Products			14,429.32	14,429.32
DEC Customer	(47.66)	11,491.23	(1,941.02)	9,502.55
DEC Customer Experience		17,634.19	18,066.50	35,700.69
DEC Environmental	(18.89)	-	176,081.84	176,062.95
DEC Fossil Hydro			60,816.66	60,816.66
DEC Gen Ops Support			287.80	287.80
DEC Nuclear	883.88		81,703.84	82,587.72
DEC Org Effectiveness			6,044.15	6,044.15
DEC Other		(0.03)	136,310.60	136,310.57
DEC Other Misc	128.99		17,079.05	17,208.04
DEC Power Delivery	(157.91)	46,113.47	784,303.25	830,258.81
DEC Regional Srvcs			1,006.74	1,006.74
DEC Whlsale Pwr & Rnwable Gen	27.84		2,701.61	2,729.45
DEF Fossil Hydro			2,660.49	2,660.49
DEF Gen Ops Support			1,500.00	1,500.00
DEF Org Effectiveness			1,000.00	1,000.00
DEF Other	2,640.36	897.83	229,655.86	233,194.05
DEF Power Delivery	6,367.61	(493.89)	(56,464.17)	(50,590.45)
DEF President & Staff			1,000.00	1,000.00
DEF Retail			(1,437.58)	(1,437.58)
DEI Customer	2.92		283.62	286.54
DEI Fossil Hydro			2,443.30	2,443.30
DEI Power Delivery	28,730.59	-	107,776.92	136,507.51
DEK Fossil			3,204.63	3,204.63
DEK Power Delivery	3.10		7,493.60	7,496.70
DEP Central Progs Srvcs			59,383.42	59,383.42
DEP Environmental	(32.34)	-	19,266.29	19,233.95
DEP Fossil Hydro			146,528.78	146,528.78
DEP Gen Ops Support	2.07		457,956.95	457,959.02
DEP Nuclear			(49,314.85)	(49,314.85)
DEP Org Effectiveness			68,042.93	68,042.93
DEP Power Delivery	66.73	25,488.50	306,082.55	331,637.78

DEP Regional Srvcs				5,186.39	5,186.39
DEP Retail				(219.57)	(219.57)
Duke Energy Ohio - RU				22,440.31	22,440.31
Marketing & Customer Engagemen				(3,644.12)	(3,644.12)
Piedmont Gas - Customer				10,190.84	10,190.84
Piedmont Gas - Delivery		136,324.15		678,640.91	814,965.06
Piedmont Gas - Other	67.68	3,228.91		1,286,339.47	1,289,636.06
Service Company Alloc Offsets				1,112.25	1,112.25
SrvCo Construct & Proj Mgmt	125.00	22,145.67		537,026.76	559,297.43
Srvco Customer Service	906.40	37,124.35		11,781,387.22	11,819,417.97
SrvCo Enterprise Business Svs	1,278,091.58	9,437,332.96	-	150,360,313.81	161,075,738.35
SrvCo EnviroHealthSafety	42,624.34	5,779.84		10,423,049.12	10,471,453.30
SrvCo Fossil Hydro Total				39,234.59	39,234.59
SrvCo Gas	7.32			22,227.06	22,234.38
SrvCo Gen Support	10,844.53			2,472,031.11	2,482,875.64
SrvCo Nuclear				259,064.31	259,064.31
SrvCo Other	24,118.95	20,225.95		18,311,226.69	18,355,571.59
SrvCo Power Delivery	22,482,673.51	6,088.20	-	12,982,042.52	35,470,804.23
Grand Total	**$ 23,879,133.25**	**$ 9,785,562.68**	**$ -**	**$224,518,155.59**	**$258,182,851.52**

Actual - 12 months ending December 2016 **See second query for department detail**

Business Unit Hierarchy **Duke Energy Kentucky Electric**

	ASSET - Assets	CAPITAL - Capital	INDIRECT - Indirect	O&M and Other Expenses	Grand Total
Q1 2016					
Jan 2016	$ 1,636,742.66	$ 666,238.09	$ 7,048.88	$ 20,270,196.47	$ 22,580,226.10
Feb 2016	3,702,214.37	1,239,268.15	16,741.04	41,282,061.00	46,240,284.56
Mar 2016	5,596,846.12	1,837,948.61	8,998.74	61,994,358.91	69,438,152.38
Q2 2016					
Apr 2016	8,297,846.05	2,470,825.19	19,054.36	82,099,789.86	92,887,515.46
May 2016	10,299,973.19	2,978,043.33	28,272.06	100,163,567.20	113,469,855.78
Jun 2016	12,172,122.59	3,508,432.59	44,642.22	118,524,183.12	134,249,380.52
Q3 2016					
Jul 2016	13,985,274.56	4,053,963.36	60,084.10	135,771,386.14	153,870,708.16
Aug 2016	15,568,695.90	4,813,948.40	14,870.37	154,807,022.31	175,204,536.98
Sep 2016	18,256,979.95	5,366,674.26	31,368.83	173,973,454.32	197,628,477.36
Q4 2016					
Oct 2016	20,219,783.46	6,006,407.84	48,099.87	193,935,197.69	220,209,488.86
Nov 2016	22,126,841.94	6,537,531.96	62,089.45	212,737,439.07	241,463,902.42
Dec 2016	23,410,934.37	6,996,734.28	-	226,839,522.61	257,247,191.26
Grand Total	**$ 23,410,934.37**	**$ 6,996,734.28**	**$ -**	**$226,839,522.61**	**$257,247,191.26**

Business Unit Hierarchy **Duke Energy Kentucky Electric**

	ASSET - Assets	CAPITAL - Capital	INDIRECT - Indirect	O&M and Other Expenses	Grand Total
Q1 2016					
Jan 2016					
100 Org Effectiveness				$ 65,329.19	$ 65,329.19
110 Central Progs Srvcs	23.61			498,765.55	498,789.16

110 Regional Srvcs			3,835.30	3,835.30
CE Commercial Power			82.87	82.87
Corporate Governance DiscOps	71.72	836.57	1,053,565.90	1,054,474.19
DE Renewables & Transmission			7,602.66	7,602.66
DEC Central Programs Services			26,651.93	26,651.93
DEC Customer			63,637.29	63,637.29
DEC Customer Experience	1.00	8,888.94	169.51	9,059.45
DEC Environmental			5,333.86	5,333.86
DEC Fossil Hydro			716.46	716.46
DEC Nuclear	13.33		1,346.40	1,359.73
DEC Org Effectiveness			21,600.30	21,600.30
DEC Other		5,227.40	24,441.07	29,668.47
DEC Other Misc		(0.01)	(7,938.00)	(7,938.01)
DEC Power Delivery	80.67	16,125.24	81,798.19	98,004.10
DEC Rates		11,018.61	934.75	11,953.36
DEF Gen Ops Support			18.71	18.71
DEF Org Effectiveness			14,016.56	14,016.56
DEF Other	78.53		7,589.91	7,668.44
DEF Power Delivery	1,353.83		17,758.63	19,112.46
DEF Retail			(691.84)	(691.84)
DEI Customer			474.19	474.19
DEI Org Effectiveness			15,209.60	15,209.60
DEI Power Delivery		156.92		156.92
DEP Central Progs Srvcs			5,160.66	5,160.66
DEP Gen Ops Support			15,324.90	15,324.90
DEP Org Effectiveness			24,202.26	24,202.26
DEP Other			2,858.24	2,858.24
DEP Power Delivery	6.74	-	(9,543.70)	(9,536.96)
DEP Retail			21,990.94	21,990.94
Marketing & Customer Engagemen			2,614.48	2,614.48
SrvCo Comm Power Other			16,615.17	16,615.17
SrvCo Construct & Proj Mgmt	19.30	-	71,746.48	71,765.78
Srvco Customer Service	42.16	519.31	870,750.07	871,311.54

SrvCo Enterprise Business Svs	69,499.47	611,402.67	7,048.88	13,534,729.55	14,222,680.57
SrvCo EnviroHealthSafety	5,981.29			822,222.32	828,203.61
SrvCo Fossil Hydro Total				7,003.70	7,003.70
SrvCo Gas				3,048.36	3,048.36
SrvCo Gen Support	83,839.94			187,916.60	271,756.54
SrvCo Nuclear				6,015.34	6,015.34
SrvCo Other	1,171.20	9,132.07		1,428,407.42	1,438,710.69
SrvCo Power Delivery	1,474,460.46	2,930.37		1,346,636.41	2,824,027.24
US DE International	99.41			10,248.28	10,347.69
Feb 2016					
100 Org Effectiveness				133,673.74	133,673.74
110 Central Progs Srvcs	47.32	1,086.74		988,336.08	989,470.14
110 Regional Srvcs				5,844.58	5,844.58
CE Commercial Power				82.87	82.87
Corporate Governance DiscOps	120.34	836.57		2,130,531.10	2,131,488.01
DE Renewables & Transmission				16,452.30	16,452.30
DEC Central Programs Services				51,507.91	51,507.91
DEC Coal Combustion Products				1,081.02	1,081.02
DEC Customer				81,069.93	81,069.93
DEC Customer Experience	1.00	8,888.94		169.51	9,059.45
DEC Environmental				13,990.82	13,990.82
DEC Fossil Hydro				910.10	910.10
DEC Nuclear	44.66			6,832.67	6,877.33
DEC Org Effectiveness				44,436.70	44,436.70
DEC Other		7,713.40		53,928.60	61,642.00
DEC Other Misc		(0.01)		(7,938.00)	(7,938.01)
DEC Power Delivery	148.21	18,969.43		135,121.65	154,239.29
DEC Rates		18,159.73		1,388.92	19,548.65
DEF Fossil Hydro				7,363.04	7,363.04
DEF Gen Ops Support				18.71	18.71
DEF Org Effectiveness				28,681.32	28,681.32
DEF Other	(31.25)	168.72		(3,515.13)	(3,377.66)
DEF Power Delivery	1,205.72			57,892.70	59,098.42

DEF Retail				640.31	640.31
DEI Customer				1,563.78	1,563.78
DEI Org Effectiveness				32,001.54	32,001.54
DEI Power Delivery		320.44			320.44
DEP Central Progs Srvcs				10,566.92	10,566.92
DEP Gen Ops Support				33,077.66	33,077.66
DEP Nuclear				1,125.47	1,125.47
DEP Org Effectiveness				50,419.48	50,419.48
DEP Other				2,858.24	2,858.24
DEP Power Delivery	15.12	-		(24,408.78)	(24,393.66)
DEP Retail		76.53		31,917.71	31,994.24
Marketing & Customer Engagemen				(427.83)	(427.83)
SrvCo Comm Power Other				32,895.93	32,895.93
SrvCo Construct & Proj Mgmt	41.07	-		174,024.17	174,065.24
Srvco Customer Service	42.16	519.31		1,860,392.35	1,860,953.82
SrvCo Enterprise Business Svs	138,906.44	1,151,091.77	16,741.04	27,443,593.44	28,750,332.69
SrvCo EnviroHealthSafety	12,538.67			1,681,581.12	1,694,119.79
SrvCo Fossil Hydro Total				14,340.92	14,340.92
SrvCo Gas				3,048.36	3,048.36
SrvCo Gen Support	161,720.67			495,502.76	657,223.43
SrvCo Nuclear				12,317.16	12,317.16
SrvCo Other	2,199.11	27,022.26		2,957,398.07	2,986,619.44
SrvCo Power Delivery	3,385,152.20	4,414.32		2,713,283.06	6,102,849.58
US DE International	62.93			6,488.02	6,550.95
Mar 2016					
100 Org Effectiveness				178,230.05	178,230.05
110 Central Progs Srvcs	71.52	1,086.74		1,435,105.22	1,436,263.48
110 Regional Srvcs				9,791.26	9,791.26
CE Commercial Power				82.87	82.87
Corporate Governance DiscOps	165.73	836.57		3,331,901.78	3,332,904.08
DE Renewables & Transmission				12,027.48	12,027.48
DEC Central Programs Services				79,883.49	79,883.49
DEC Coal Combustion Products				1,066.74	1,066.74

DEC Customer				46,392.61	46,392.61
DEC Customer Experience	1.00	8,888.94		169.51	9,059.45
DEC Environmental				19,940.10	19,940.10
DEC Fossil Hydro				5,537.09	5,537.09
DEC Nuclear	64.82			28,131.14	28,195.96
DEC Org Effectiveness				66,081.66	66,081.66
DEC Other		-		91,418.90	91,418.90
DEC Other Misc		(0.01)		(7,938.00)	(7,938.01)
DEC Power Delivery	164.66	20,663.83		149,744.97	170,573.46
DEC Rates		25,245.13		1,839.58	27,084.71
DEF Fossil Hydro				13,115.90	13,115.90
DEF Gen Ops Support				18.71	18.71
DEF Org Effectiveness				41,583.11	41,583.11
DEF Other	222.05	632.70		24,783.47	25,638.22
DEF Power Delivery	2,399.43			105,133.08	107,532.51
DEF Retail				(1,866.13)	(1,866.13)
DEI Customer				1,021.86	1,021.86
DEI Org Effectiveness				50,744.38	50,744.38
DEI Power Delivery		320.44			320.44
DEK Power Delivery				(1,659.24)	(1,659.24)
DEP Central Progs Srvcs				15,882.25	15,882.25
DEP Gen Ops Support				37,617.34	37,617.34
DEP Nuclear				2,337.04	2,337.04
DEP Org Effectiveness				70,931.84	70,931.84
DEP Other				2,858.24	2,858.24
DEP Power Delivery	48.01	2,926.08		(27,413.05)	(24,438.96)
DEP Retail		76.53		9,353.73	9,430.26
Marketing & Customer Engagemen				349.35	349.35
SrvCo Comm Power Other				50,939.19	50,939.19
SrvCo Construct & Proj Mgmt	61.01	-		272,701.91	272,762.92
Srvco Customer Service	42.16	519.31		2,799,009.78	2,799,571.25
SrvCo Enterprise Business Svs	208,501.16	1,730,525.02	8,798.74	41,053,703.75	43,001,528.67
SrvCo EnviroHealthSafety	19,608.57		200.00	2,517,451.41	2,537,259.98

SrvCo Fossil Hydro Total			21,548.20	21,548.20
SrvCo Gas			3,048.36	3,048.36
SrvCo Gen Support	92,002.02		947,394.96	1,039,396.98
SrvCo Nuclear			18,507.40	18,507.40
SrvCo Other	3,437.44	39,899.86	4,491,899.75	4,535,237.05
SrvCo Power Delivery	5,270,011.97	6,327.47	4,019,360.09	9,295,699.53
US DE International	44.57		4,595.78	4,640.35
Q2 2016				
Apr 2016				
100 Org Effectiveness			243,756.10	243,756.10
110 Central Progs Srvcs	97.23	2,739.17	1,895,943.54	1,898,779.94
110 Regional Srvcs			9,978.40	9,978.40
CE Commercial Power			82.87	82.87
Corporate Governance DiscOps	245.71	836.57	3,184,528.46	3,185,610.74
DE Renewables & Transmission			14,259.52	14,259.52
DEC Central Programs Services			104,987.22	104,987.22
DEC Coal Combustion Products			1,066.74	1,066.74
DEC Customer	2.10		63,723.24	63,725.34
DEC Customer Experience	1.00	8,888.94	169.51	9,059.45
DEC Environmental			27,892.40	27,892.40
DEC Fossil Hydro			5,685.53	5,685.53
DEC Nuclear	105.31		60,994.43	61,099.74
DEC Org Effectiveness			89,802.64	89,802.64
DEC Other		-	119,919.83	119,919.83
DEC Other Misc		(0.01)	(7,938.00)	(7,938.01)
DEC Power Delivery	257.21	22,044.00	196,605.13	218,906.34
DEC President & Staff			406.24	406.24
DEC Rates		32,638.69	2,309.76	34,948.45
DEF Fossil Hydro			19,952.08	19,952.08
DEF Gen Ops Support			18.71	18.71
DEF Org Effectiveness			56,957.89	56,957.89
DEF Other	542.28	1,138.86	64,224.61	65,905.75
DEF Power Delivery	4,209.91		161,593.42	165,803.33

DEF Retail				4,179.69	4,179.69
DEI Customer				1,021.86	1,021.86
DEI Org Effectiveness				65,180.73	65,180.73
DEI Power Delivery	5.79	320.43		923.92	1,250.14
DEK Power Delivery				(1,659.24)	(1,659.24)
DEP Central Progs Srvcs				21,423.87	21,423.87
DEP Gen Ops Support				56,151.22	56,151.22
DEP Nuclear		177.55		21,896.04	22,073.59
DEP Org Effectiveness				97,585.46	97,585.46
DEP Other				2,858.24	2,858.24
DEP Power Delivery	60.93	4,447.50		(14,427.05)	(9,918.62)
DEP Retail		76.53		9,353.73	9,430.26
Duke Energy Ohio - RU		1,055.28			1,055.28
Marketing & Customer Engagemen				1,645.57	1,645.57
SrvCo Comm Power Other				50,939.19	50,939.19
SrvCo Construct & Proj Mgmt	81.55	-		375,504.33	375,585.88
Srvco Customer Service	42.16	519.33		3,965,603.09	3,966,164.58
SrvCo Enterprise Business Svs	281,102.88	2,341,671.41	18,854.36	55,009,397.84	57,651,026.49
SrvCo EnviroHealthSafety	27,915.27		200.00	3,390,845.60	3,418,960.87
SrvCo Fossil Hydro Total				21,548.20	21,548.20
SrvCo Gas				3,048.36	3,048.36
SrvCo Gen Support	180,571.63			1,235,242.04	1,415,813.67
SrvCo Nuclear				23,028.92	23,028.92
SrvCo Other	4,820.54	45,452.04		6,112,090.49	6,162,363.07
SrvCo Power Delivery	7,797,739.98	8,818.90		5,324,891.71	13,131,450.59
US DE International	44.57			4,595.78	4,640.35
May 2016					
100 Org Effectiveness				317,634.01	317,634.01
110 Central Progs Srvcs	121.72	4,294.01		2,310,190.98	2,314,606.71
110 Regional Srvcs				9,978.40	9,978.40
CE Commercial Power				82.87	82.87
Corporate Governance DiscOps	304.71	836.57		2,989,626.66	2,990,767.94
DE Renewables & Transmission				16,524.58	16,524.58

DEC Central Programs Services			129,369.49	129,369.49
DEC Coal Combustion Products			1,066.74	1,066.74
DEC Customer	18.50		83,399.77	83,418.27
DEC Customer Experience	(10.11)	8,888.94	169.51	9,048.34
DEC Environmental			35,736.74	35,736.74
DEC Fossil Hydro		559.23	5,866.93	6,426.16
DEC Gen Ops Support			1,535.38	1,535.38
DEC Nuclear	121.97		79,492.20	79,614.17
DEC Org Effectiveness			110,588.49	110,588.49
DEC Other		-	146,964.09	146,964.09
DEC Other Misc		(0.01)	(7,938.00)	(7,938.01)
DEC Power Delivery	244.31	22,141.50	204,019.01	226,404.82
DEC President & Staff			10,735.62	10,735.62
DEC Rates		34,486.97	2,427.35	36,914.32
DEC Whlsale Pwr & Rnwable Gen			650.00	650.00
DEF Fossil Hydro			27,137.31	27,137.31
DEF Gen Ops Support			18.71	18.71
DEF Org Effectiveness			70,385.14	70,385.14
DEF Other	567.09	1,138.86	69,726.98	71,432.93
DEF Power Delivery	3,072.41		142,411.62	145,484.03
DEF Retail			11,288.31	11,288.31
DEI Customer			1,021.86	1,021.86
DEI Org Effectiveness			78,468.88	78,468.88
DEI Power Delivery	5.79	320.44	923.92	1,250.15
DEK Power Delivery			(1,659.24)	(1,659.24)
DEP Central Progs Srvcs			26,710.99	26,710.99
DEP Gen Ops Support			68,506.78	68,506.78
DEP Nuclear		177.55	21,896.04	22,073.59
DEP Org Effectiveness			123,218.90	123,218.90
DEP Other			2,858.24	2,858.24
DEP Power Delivery	72.64	4,447.50	3,100.52	7,620.66
DEP Regional Srvcs			1,075.75	1,075.75
DEP Retail		76.53	9,353.73	9,430.26

Duke Energy Ohio - RU		1,055.28		5,058.74	6,114.02
Marketing & Customer Engagemen				2,693.35	2,693.35
SrvCo Comm Power Other				50,939.19	50,939.19
SrvCo Construct & Proj Mgmt	96.78	(0.01)		461,551.81	461,648.58
Srvco Customer Service	46.69	519.32		4,906,517.73	4,907,083.74
SrvCo Enterprise Business Svs	346,644.52	2,837,502.69	28,072.06	67,821,636.86	71,033,856.13
SrvCo EnviroHealthSafety	36,023.20		200.00	4,209,229.70	4,245,452.90
SrvCo Fossil Hydro Total				21,548.20	21,548.20
SrvCo Gas				3,048.36	3,048.36
SrvCo Gen Support	262,561.33			1,478,061.78	1,740,623.11
SrvCo Nuclear				28,896.12	28,896.12
SrvCo Other	6,013.29	50,921.85		7,545,046.59	7,601,981.73
SrvCo Power Delivery	9,644,068.36	10,676.11		6,524,773.51	16,179,517.98
US DE International	(0.01)			-	(0.01)
Jun 2016					
100 Org Effectiveness				384,234.96	384,234.96
110 Central Progs Srvcs	148.01	4,294.01		2,752,054.61	2,756,496.63
110 Regional Srvcs				13,753.54	13,753.54
CE Commercial Power				82.87	82.87
Corporate Governance DiscOps	375.92	836.57		2,676,689.35	2,677,901.84
DE Renewables & Transmission				18,594.11	18,594.11
DEC Central Programs Services				154,726.19	154,726.19
DEC Coal Combustion Products				1,066.74	1,066.74
DEC Customer	11.09			104,103.19	104,114.28
DEC Customer Experience	(10.11)	8,888.94		210.28	9,089.11
DEC Environmental				43,101.70	43,101.70
DEC Fossil Hydro		559.23		5,866.93	6,426.16
DEC Gen Ops Support				1,535.38	1,535.38
DEC Nuclear	147.41			87,701.91	87,849.32
DEC Org Effectiveness				132,667.38	132,667.38
DEC Other		-		174,524.97	174,524.97
DEC Other Misc		(0.01)		(7,938.00)	(7,938.01)
DEC Power Delivery	987.26	22,396.35		244,128.44	267,512.05

DEC President & Staff				10,735.62	10,735.62
DEC Rates		37,703.96		2,677.35	40,381.31
DEC Whlsale Pwr & Rnwable Gen				650.00	650.00
DEF Fossil Hydro				35,385.61	35,385.61
DEF Gen Ops Support				18.71	18.71
DEF Org Effectiveness				85,199.49	85,199.49
DEF Other	127.33	885.78		27,460.72	28,473.83
DEF Power Delivery	(1,162.46)			182,903.40	181,740.94
DEF Retail				18,288.61	18,288.61
DEI Customer				1,021.86	1,021.86
DEI Org Effectiveness				95,156.32	95,156.32
DEI Power Delivery	5.79	320.44		923.92	1,250.15
DEK Power Delivery				(1,659.24)	(1,659.24)
DEP Central Progs Srvcs				32,252.45	32,252.45
DEP Environmental				1,000.00	1,000.00
DEP Gen Ops Support				87,040.66	87,040.66
DEP Nuclear		177.55		34,854.57	35,032.12
DEP Org Effectiveness				149,872.52	149,872.52
DEP Other				2,858.24	2,858.24
DEP Power Delivery	77.81	4,447.49		15,668.64	20,193.94
DEP Regional Srvcs				4,743.98	4,743.98
DEP Retail		76.53		9,353.73	9,430.26
Duke Energy Ohio - RU		1,055.28		5,058.74	6,114.02
Marketing & Customer Engagemen				3,989.59	3,989.59
SrvCo Comm Power Other				50,939.19	50,939.19
SrvCo Construct & Proj Mgmt	105.69	(0.02)		544,290.61	544,396.28
Srvco Customer Service	76.58	519.31		5,758,581.49	5,759,177.38
SrvCo Enterprise Business Svs	414,271.00	3,360,823.43	44,442.22	80,939,594.95	84,759,131.60
SrvCo EnviroHealthSafety	47,433.39		200.00	5,091,675.24	5,139,308.63
SrvCo Fossil Hydro Total				21,548.20	21,548.20
SrvCo Gas				3,676.28	3,676.28
SrvCo Gen Support	342,966.74	559.62		1,755,439.14	2,098,965.50
SrvCo Nuclear				35,355.48	35,355.48

SrvCo Other	7,240.50	51,812.49	8,981,439.68	9,040,492.67
SrvCo Power Delivery	11,359,320.65	13,075.64	7,749,082.82	19,121,479.11
US DE International	(0.01)		-	(0.01)
Q3 2016				
Jul 2016				
100 Org Effectiveness			446,030.81	446,030.81
110 Central Progs Srvcs	168.75	4,294.01	3,136,183.79	3,140,646.55
110 Regional Srvcs			16,140.22	16,140.22
CE Commercial Power			82.87	82.87
Corporate Governance DiscOps	426.30	836.57	2,501,355.37	2,502,618.24
DE Renewables & Transmission			20,135.25	20,135.25
DEC Central Programs Services			170,878.23	170,878.23
DEC Coal Combustion Products			1,066.74	1,066.74
DEC Customer	11.09		125,512.69	125,523.78
DEC Customer Experience	(10.11)	8,888.94	2,886.78	11,765.61
DEC Environmental			50,245.26	50,245.26
DEC Fossil Hydro		559.23	5,866.93	6,426.16
DEC Gen Ops Support			1,535.38	1,535.38
DEC Nuclear	159.41		89,298.01	89,457.42
DEC Org Effectiveness			149,583.09	149,583.09
DEC Other		-	201,017.35	201,017.35
DEC Other Misc		(0.01)	(7,938.00)	(7,938.01)
DEC Power Delivery	1,003.22	22,890.16	283,761.79	307,655.17
DEC President & Staff			10,735.62	10,735.62
DEC Rates		45,210.26	2,677.35	47,887.61
DEC Whlsale Pwr & Rnwable Gen			650.00	650.00
DEF Fossil Hydro			38,763.23	38,763.23
DEF Gen Ops Support			18.71	18.71
DEF Org Effectiveness			100,213.87	100,213.87
DEF Other	209.71	885.78	43,525.26	44,620.75
DEF Power Delivery	(807.94)	0.01	249,445.29	248,637.36
DEF Retail			23,029.95	23,029.95
DEI Customer			1,021.86	1,021.86

DEI Org Effectiveness				109,229.41	109,229.41
DEI Power Delivery	5.79	320.44		923.92	1,250.15
DEK Power Delivery				(1,659.24)	(1,659.24)
DEP Central Progs Srvcs				33,785.60	33,785.60
DEP Environmental				1,000.00	1,000.00
DEP Gen Ops Support				104,812.87	104,812.87
DEP Nuclear		177.55		35,099.56	35,277.11
DEP Org Effectiveness				173,600.22	173,600.22
DEP Other				2,858.24	2,858.24
DEP Power Delivery	84.17	4,512.66		26,475.26	31,072.09
DEP Regional Srvcs				8,097.63	8,097.63
DEP Retail		76.53		9,353.73	9,430.26
Duke Energy Ohio - RU		1,055.28		9,626.11	10,681.39
Marketing & Customer Engagemen				4,578.79	4,578.79
SrvCo Comm Power Other				50,939.19	50,939.19
SrvCo Construct & Proj Mgmt	115.49	(0.02)		625,790.55	625,906.02
Srvco Customer Service	81.34	519.30		6,658,928.46	6,659,529.10
SrvCo Enterprise Business Svs	476,385.53	3,893,876.90	59,884.10	93,007,990.04	97,438,136.57
SrvCo EnviroHealthSafety	58,720.53		200.00	5,920,883.13	5,979,803.66
SrvCo Fossil Hydro Total				21,548.20	21,548.20
SrvCo Gas				5,367.40	5,367.40
SrvCo Gen Support	422,427.22	559.62		2,012,129.32	2,435,116.16
SrvCo Nuclear				40,053.16	40,053.16
SrvCo Other	8,445.90	54,410.36		10,347,780.25	10,410,636.51
SrvCo Power Delivery	13,017,848.17	14,889.79		8,898,470.64	21,931,208.60
US DE International	(0.01)			-	(0.01)
Aug 2016					
100 Org Effectiveness				519,247.21	519,247.21
110 Central Progs Srvcs	210.02	4,294.01		3,574,317.06	3,578,821.09
110 Regional Srvcs				17,637.82	17,637.82
CE Commercial Power				82.87	82.87
Corporate Governance DiscOps	522.07	836.57		2,360,507.71	2,361,866.35
DE Renewables & Transmission				21,603.00	21,603.00

DEC Central Programs Services			197,415.68	197,415.68
DEC Coal Combustion Products			1,066.74	1,066.74
DEC Customer	27.75		141,978.07	142,005.82
DEC Customer Experience	(10.11)	8,888.94	5,494.87	14,373.70
DEC Environmental			56,301.32	56,301.32
DEC Fleet Maint Srvcs			127.05	127.05
DEC Fossil Hydro		559.23	6,250.38	6,809.61
DEC Gen Ops Support			1,535.38	1,535.38
DEC Nuclear	188.74		92,260.09	92,448.83
DEC Org Effectiveness			171,279.74	171,279.74
DEC Other		-	227,914.57	227,914.57
DEC Other Misc		(0.01)	(7,710.20)	(7,710.21)
DEC Power Delivery	1,022.04	24,511.94	297,524.77	323,058.75
DEC President & Staff			10,735.62	10,735.62
DEC Rates		52,910.16	2,677.35	55,587.51
DEC Whlsale Pwr & Rnwable Gen			650.00	650.00
DEF Fossil Hydro			40,316.15	40,316.15
DEF Gen Ops Support			18.71	18.71
DEF Org Effectiveness			114,599.74	114,599.74
DEF Other	239.13	885.78	47,699.47	48,824.38
DEF Power Delivery	(537.52)	1,054.70	281,132.91	281,650.09
DEF Retail			29,738.57	29,738.57
DEI Customer			1,021.86	1,021.86
DEI Org Effectiveness			125,460.03	125,460.03
DEI Power Delivery	5.79	320.44	923.92	1,250.15
DEK Power Delivery			(1,659.24)	(1,659.24)
DEP Central Progs Srvcs			37,957.51	37,957.51
DEP Environmental			1,300.00	1,300.00
DEP Gen Ops Support			123,346.75	123,346.75
DEP Nuclear		177.55	35,099.56	35,277.11
DEP Org Effectiveness			197,288.10	197,288.10
DEP Other			2,858.24	2,858.24
DEP Power Delivery	88.87	5,983.32	37,622.91	43,695.10

DEP Regional Srvcs				11,333.31	11,333.31
DEP Retail		76.53		9,353.73	9,430.26
Duke Energy Ohio - RU		1,055.28		9,892.39	10,947.67
Marketing & Customer Engagemen				4,578.79	4,578.79
SrvCo Comm Power Other				50,939.19	50,939.19
SrvCo Construct & Proj Mgmt	124.87	(0.02)		708,205.26	708,330.11
Srvco Customer Service	100.74	537.45		7,660,637.03	7,661,275.22
SrvCo Enterprise Business Svs	577,610.81	4,637,721.63	14,670.37	105,993,731.18	111,223,733.99
SrvCo EnviroHealthSafety	71,151.87		200.00	6,817,698.43	6,889,050.30
SrvCo Fossil Hydro Total				21,681.54	21,681.54
SrvCo Gas	-			14,492.08	14,492.08
SrvCo Gen Support	91,861.88	960.33		2,702,285.82	2,795,108.03
SrvCo Nuclear				45,044.52	45,044.52
SrvCo Other	9,792.75	55,696.92		11,851,213.04	11,916,702.71
SrvCo Power Delivery	14,816,290.50	17,477.65		10,131,724.87	24,965,493.02
US DE International	5.70			588.84	594.54
Sep 2016					
100 Org Effectiveness				591,261.75	591,261.75
110 Central Progs Srvcs	235.46	4,294.01		3,999,855.14	4,004,384.61
110 Regional Srvcs				20,468.27	20,468.27
CE Commercial Power				82.87	82.87
Corporate Governance DiscOps	634.21	836.57		2,637,455.27	2,638,926.05
DE Renewables & Transmission				24,039.46	24,039.46
DEC Central Programs Services				221,254.26	221,254.26
DEC Coal Combustion Products				1,066.74	1,066.74
DEC Customer	9.65			82,484.69	82,494.34
DEC Customer Experience	(10.11)	8,888.94		8,169.59	17,048.42
DEC Environmental				67,862.88	67,862.88
DEC Fleet Maint Srvcs				127.05	127.05
DEC Fossil Hydro		559.23		6,250.38	6,809.61
DEC Gen Ops Support				1,535.38	1,535.38
DEC Nuclear	228.73			86,954.31	87,183.04
DEC Org Effectiveness				186,237.44	186,237.44

DEC Other		(0.01)		256,536.55	256,536.54
DEC Other Misc		(0.01)		(7,710.20)	(7,710.21)
DEC Power Delivery	1,047.67	25,950.59		287,723.08	314,721.34
DEC President & Staff				406.24	406.24
DEC Rates		60,059.02		2,677.35	62,736.37
DEC Whlsale Pwr & Rnwable Gen				650.00	650.00
DEF Fossil Hydro				40,316.15	40,316.15
DEF Gen Ops Support				18.71	18.71
DEF Org Effectiveness				129,049.32	129,049.32
DEF Other	387.95	893.76		53,554.95	54,836.66
DEF Power Delivery	2,350.55	1,535.68		280,984.98	284,871.21
DEF Retail				18,394.57	18,394.57
DEI Customer				1,089.59	1,089.59
DEI Org Effectiveness				140,554.49	140,554.49
DEI Power Delivery	70.61	320.45		(1,680.15)	(1,289.09)
DEK Power Delivery				(1,659.24)	(1,659.24)
DEP Central Progs Srvcs				43,218.91	43,218.91
DEP Environmental				1,300.00	1,300.00
DEP Fleet Maint Srvcs	110.54			-	110.54
DEP Gen Ops Support				141,038.15	141,038.15
DEP Nuclear		177.55		35,099.56	35,277.11
DEP Org Effectiveness				207,122.40	207,122.40
DEP Other				2,858.24	2,858.24
DEP Power Delivery	105.54	7,526.27		28,774.56	36,406.37
DEP Regional Srvcs				11,333.31	11,333.31
DEP Retail		76.53		9,292.11	9,368.64
Duke Energy Ohio - RU		-		10,433.51	10,433.51
Marketing & Customer Engagemen				4,578.79	4,578.79
SrvCo Comm Power Other				50,939.19	50,939.19
SrvCo Construct & Proj Mgmt	134.30	(0.02)		795,643.35	795,777.63
Srvco Customer Service	101.69	537.44		8,945,551.01	8,946,190.14
SrvCo Enterprise Business Svs	698,965.53	5,177,959.90	31,168.83	119,226,384.49	125,134,478.75
SrvCo EnviroHealthSafety	80,462.16		200.00	7,688,178.36	7,768,840.52

SrvCo Fossil Hydro Total			27,546.27	27,546.27
SrvCo Gas	-		18,211.59	18,211.59
SrvCo Gen Support	158,190.88	1,199.48	2,925,661.62	3,085,051.98
SrvCo Nuclear			50,035.80	50,035.80
SrvCo Other	11,067.63	55,728.84	13,244,239.28	13,311,035.75
SrvCo Power Delivery	17,302,881.26	20,130.04	11,369,413.11	28,692,424.41
US DE International	5.70		588.84	594.54
Q4 2016				
Oct 2016				
100 Org Effectiveness			657,916.01	657,916.01
110 Central Progs Srvcs	260.61	4,294.01	4,346,561.53	4,351,116.15
110 Regional Srvcs			42,639.26	42,639.26
CE Commercial Power			82.87	82.87
Corporate Governance DiscOps	700.10	836.57	4,068,814.94	4,070,351.61
DE Renewables & Transmission			25,947.54	25,947.54
DEC Central Programs Services			246,299.82	246,299.82
DEC Coal Combustion Products			1,066.74	1,066.74
DEC Customer	2.08		37,379.01	37,381.09
DEC Customer Experience	(10.11)	8,888.94	11,501.07	20,379.90
DEC Environmental			80,426.85	80,426.85
DEC Fleet Maint Srvcs			127.05	127.05
DEC Fossil Hydro		559.23	16,781.11	17,340.34
DEC Gen Ops Support			1,535.38	1,535.38
DEC Nuclear	268.30		90,951.44	91,219.74
DEC Org Effectiveness			195,616.04	195,616.04
DEC Other		(0.01)	284,714.53	284,714.52
DEC Other Misc		(0.01)	(7,710.20)	(7,710.21)
DEC Power Delivery	1,098.60	27,158.73	311,674.12	339,931.45
DEC President & Staff			406.24	406.24
DEC Rates		63,794.29	2,677.35	66,471.64
DEC Regional Srvcs			2,000.00	2,000.00
DEC Whlsale Pwr & Rnwable Gen			650.00	650.00
DEF Fossil Hydro			40,814.03	40,814.03

DEF Gen Ops Support				18.71	18.71
DEF Org Effectiveness				137,407.96	137,407.96
DEF Other	234.89	893.76		38,422.74	39,551.39
DEF Power Delivery	3,142.64	2,029.53		319,173.27	324,345.44
DEF Retail				(55.69)	(55.69)
DEI Customer				1,089.59	1,089.59
DEI Org Effectiveness				156,849.01	156,849.01
DEI Power Delivery	70.61	320.45		(2,972.81)	(2,581.75)
DEK Power Delivery				(1,659.24)	(1,659.24)
DEP Central Progs Srvcs				48,760.45	48,760.45
DEP Environmental				1,300.00	1,300.00
DEP Fleet Maint Srvcs	110.54			-	110.54
DEP Gen Ops Support				156,471.31	156,471.31
DEP Nuclear		177.55		35,099.56	35,277.11
DEP Org Effectiveness				226,858.52	226,858.52
DEP Other				2,858.24	2,858.24
DEP Power Delivery	108.57	8,230.45		33,369.51	41,708.53
DEP Regional Srvcs				11,333.31	11,333.31
DEP Retail		76.53		9,292.11	9,368.64
Duke Energy Ohio - RU		-		10,433.51	10,433.51
Marketing & Customer Engagemen				5,790.31	5,790.31
Piedmont Gas - Other				19,669.79	19,669.79
SrvCo Comm Power Other				50,939.19	50,939.19
SrvCo Construct & Proj Mgmt	144.38	(0.02)		881,103.31	881,247.67
Srvco Customer Service	163.69	537.43		9,943,380.54	9,944,081.66
SrvCo Enterprise Business Svs	809,175.62	5,809,091.68	47,899.87	132,304,621.94	138,970,789.11
SrvCo EnviroHealthSafety	85,621.18		200.00	8,580,974.88	8,666,796.06
SrvCo Fossil Hydro Total		62.52		44,542.67	44,605.19
SrvCo Gas	-			24,306.16	24,306.16
SrvCo Gen Support	228,628.68	1,289.64		3,153,864.06	3,383,782.38
SrvCo Nuclear				55,599.60	55,599.60
SrvCo Other	12,404.29	55,811.40		14,695,442.11	14,763,657.80
SrvCo Power Delivery	19,077,653.09	22,355.17		12,531,451.50	31,631,459.76

US DE International	5.70		588.84	594.54
Nov 2016				
100 Org Effectiveness			723,194.12	723,194.12
110 Central Progs Srvcs	285.03	4,294.01	4,677,580.36	4,682,159.40
110 Regional Srvcs			78,436.14	78,436.14
CE Commercial Power			82.87	82.87
Corporate Governance DiscOps	771.24	836.57	5,425,323.79	5,426,931.60
DE Renewables & Transmission			27,415.30	27,415.30
DEC Central Programs Services			268,887.08	268,887.08
DEC Coal Combustion Products			1,066.74	1,066.74
DEC Customer	46.56	-	37,528.04	37,574.60
DEC Customer Experience	(10.11)	8,888.94	12,763.80	21,642.63
DEC Environmental			91,692.13	91,692.13
DEC Fleet Maint Srvcs			127.05	127.05
DEC Fossil Hydro		559.23	25,276.88	25,836.11
DEC Gen Ops Support			1,535.38	1,535.38
DEC Nuclear	326.11		(45,100.14)	(44,774.03)
DEC Org Effectiveness			203,871.18	203,871.18
DEC Other		(0.03)	298,806.26	298,806.23
DEC Other Misc		(0.01)	(7,710.20)	(7,710.21)
DEC Power Delivery	1,155.28	27,893.26	335,258.58	364,307.12
DEC President & Staff			15,000.00	15,000.00
DEC Rates		63,794.29	2,677.35	66,471.64
DEC Regional Srvcs			2,000.00	2,000.00
DEC Whlsale Pwr & Rnwable Gen		-	650.00	650.00
DEF Fossil Hydro			40,814.03	40,814.03
DEF Gen Ops Support			18.71	18.71
DEF Org Effectiveness			144,734.57	144,734.57
DEF Other	94.04	885.78	24,289.12	25,268.94
DEF Power Delivery	974.70	2,011.51	73,527.68	76,513.89
DEF Retail			(5,465.19)	(5,465.19)
DEI Customer			1,089.59	1,089.59
DEI Fossil Hydro			433.23	433.23

DEI Org Effectiveness				157,489.51	157,489.51
DEI Power Delivery	89.77	320.47		(1,131.18)	(720.94)
DEK Power Delivery				(1,659.24)	(1,659.24)
DEP Central Progs Srvcs				60,255.53	60,255.53
DEP Environmental				4,300.00	4,300.00
DEP Fleet Maint Srvcs	110.54			-	110.54
DEP Gen Ops Support				167,519.69	167,519.69
DEP Nuclear		177.55		61,060.14	61,237.69
DEP Org Effectiveness				233,707.70	233,707.70
DEP Other				5,358.24	5,358.24
DEP Power Delivery	110.57	8,728.39		42,733.32	51,572.28
DEP Regional Srvcs				16,115.13	16,115.13
DEP Retail		76.53		19,292.11	19,368.64
Duke Energy Ohio - RU		-		13,433.51	13,433.51
Marketing & Customer Engagemen				5,790.31	5,790.31
Piedmont Gas - Other				43,948.64	43,948.64
SrvCo Comm Power Other				50,939.19	50,939.19
SrvCo Construct & Proj Mgmt	153.55	(0.02)		956,999.52	957,153.05
Srvco Customer Service	249.70	537.44		10,921,409.56	10,922,196.70
SrvCo Enterprise Business Svs	905,690.87	6,337,069.62	61,734.05	144,597,144.15	151,901,638.69
SrvCo EnviroHealthSafety	89,701.20		200.00	9,398,843.21	9,488,744.41
SrvCo Fossil Hydro Total		62.52		59,127.80	59,190.32
SrvCo Gas	-			46,432.78	46,432.78
SrvCo Gen Support	296,511.19	1,289.64		3,371,089.06	3,668,889.89
SrvCo Nuclear				76,291.18	76,291.18
SrvCo Other	13,478.82	55,960.54		16,037,436.96	16,106,876.32
SrvCo Power Delivery	20,817,097.18	24,145.73	155.40	13,937,118.96	34,778,517.27
US DE International	5.70			588.84	594.54
Dec 2016					
100 Org Effectiveness				762,322.48	762,322.48
110 Central Progs Srvcs	305.81	4,294.01		4,924,817.35	4,929,417.17
110 Regional Srvcs				122,541.65	122,541.65
CE Commercial Power				82.87	82.87

Corporate Governance DiscOps	745.28	836.57	6,316,956.02	6,318,537.87
DE Renewables & Transmission			29,367.41	29,367.41
DEC Central Programs Services			2,284.15	2,284.15
DEC Coal Combustion Products			-	-
DEC Customer	43.64	-	28,679.76	28,723.40
DEC Customer Experience	(10.11)	8,888.94	18,720.40	27,599.23
DEC Environmental			98,023.47	98,023.47
DEC Fleet Maint Srvcs			-	-
DEC Fossil Hydro		559.23	8,976.65	9,535.88
DEC Gen Ops Support			1,535.38	1,535.38
DEC Nuclear	332.44		(44,460.60)	(44,128.16)
DEC Org Effectiveness			200.00	200.00
DEC Other		(0.03)	322,066.84	322,066.81
DEC Other Misc		(0.01)	(7,310.20)	(7,310.21)
DEC Power Delivery	1,160.79	28,369.87	342,927.35	372,458.01
DEC President & Staff			22,500.00	22,500.00
DEC Rates		63,794.29	2,677.35	66,471.64
DEC Regional Srvcs			-	-
DEC Whlsale Pwr & Rnwable Gen		-	650.00	650.00
DEF Fossil Hydro			3,744.96	3,744.96
DEF Gen Ops Support			18.71	18.71
DEF Org Effectiveness			-	-
DEF Other	128.09	885.78	22,086.25	23,100.12
DEF Power Delivery	279.89	2,011.51	95,947.62	98,239.02
DEF Retail			(3,965.19)	(3,965.19)
DEI Customer			1,089.59	1,089.59
DEI Fossil Hydro			222.09	222.09
DEI Org Effectiveness			16,935.02	16,935.02
DEI Power Delivery	89.77	320.47	(1,131.18)	(720.94)
DEK Power Delivery			(1,659.24)	(1,659.24)
DEP Central Progs Srvcs			-	-
DEP Environmental			4,300.00	4,300.00
DEP Fleet Maint Srvcs	110.54		-	110.54

DEP Gen Ops Support				-	-
DEP Nuclear		177.55		86,829.82	87,007.37
DEP Org Effectiveness				-	-
DEP Other				2,500.00	2,500.00
DEP Power Delivery	65.33	8,857.19		47,419.69	56,342.21
DEP Regional Srvcs				11,333.31	11,333.31
DEP Retail		76.53		19,542.11	19,618.64
Duke Energy Ohio - RU		-		8,374.77	8,374.77
Marketing & Customer Engagemen				10,828.79	10,828.79
Piedmont Gas - Other				65,871.72	65,871.72
Service Company Alloc Offsets				(18,646.38)	(18,646.38)
SrvCo Comm Power Other				50,939.19	50,939.19
SrvCo Construct & Proj Mgmt	161.10	(0.02)		1,009,720.77	1,009,881.85
Srvco Customer Service	278.46	537.44		11,727,967.70	11,728,783.60
SrvCo Enterprise Business Svs	977,421.99	6,793,197.74	-	154,623,337.07	162,393,956.80
SrvCo EnviroHealthSafety	85,647.63		-	10,075,271.97	10,160,919.60
SrvCo Fossil Hydro Total		62.52		68,961.75	69,024.27
SrvCo Gas	-			50,415.46	50,415.46
SrvCo Gen Support	13,507.16	1,289.64		3,840,468.27	3,855,265.07
SrvCo Nuclear				94,766.48	94,766.48
SrvCo Other	14,282.39	56,229.50		17,128,676.56	17,199,188.45
SrvCo Power Delivery	22,316,378.47	26,345.56	-	14,843,207.76	37,185,931.79
US DE International	5.70			588.84	594.54
Grand Total	**$ 23,410,934.37**	**$ 6,996,734.28**	**$ -**	**$226,839,522.61**	**$257,247,191.26**

Actual Headcount by Month and Year for DEBS Pay Company

Headcount at Month End. Only full time employees, includes temps

		Month											
Year	**Level 4 Dept**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
2016	Admin Svcs & Human Resources								486	483	489	488	482
	CEO & Staff	14	13	12	12	12	11	10	10	10	10	10	10
	Commercial Portfolio	1	1	1	1	1	1						
	Distb, Cust Ops & DE Carolina									1,684	1,437	1,442	1,409
	Energy Solutions&MW/FL Regions									192	190	189	188
	Extnl Affairs&Strategic Policy	170	170										
	Finance	702	699	698	693	693	2,372						
	Finance & Technology							2,373	2,346	2,296	2,283	2,269	2,249
	Gas Operations										246	250	250
	Generation & Transmission	1,516	1,511	1,499	1,494	1,494	2,322	2,317	2,301	2,298	2,300	2,295	2,280
	Human Resources	227	223	221	215	215	503	490					
	Legal, E&C and EASP								317	316	315	316	316
	Legal, Ethics & Compliance	175	173	340	336	336	333	321					
	Mkt Solutions Carolinas Region	1,005	1,018	1,009	1,005	1,005	1,011	1,007	996				
	MW & FL Regions	854	848	850	846	846	858	862	858				
	Strategic Services	2,842	2,846	2,835	2,745	2,745							
	Strategy Execution Office	4	4	4	5	5	4	4	4	4	4	4	4
2016 Total		**7,510**	**7,506**	**7,469**	**7,352**	**7,352**	**7,415**	**7,384**	**7,318**	**7,283**	**7,274**	**7,263**	**7,188**
2017	Admin Svcs & Human Resources	473	477	473	475	486	494	491	485	485	484	488	494
	CEO & Staff	10	10	10	11	10	10	10	10	10	10	10	10
	Distb, Cust Ops & DE Carolina	1,372	1,378	1,345	1,357	1,354	1,349	1,401	1,364	1,380	1,373	1,389	1,389
	Energy Solutions&MW/FL Regions	194	196	198	198	206	210	213	246	244	246	248	227
	Finance & Technology	2,220	2,224	2,231	2,233	2,267	2,288	2,301	2,287	2,309	2,341	2,349	2,373
	Gas Operations	249	247	245	244	246	242	247	248	250	246	247	247
	Generation & Transmission	2,278	2,283	2,288	2,282	2,309	2,328	2,325	2,304	2,307	2,300	2,286	2,262
	Legal, E&C & External Affairs					312	323	323	318	317	317	316	316
	Legal, E&C and EASP	310	309	312	309								
	Strategy Execution Office	3	3	3	3	3	4	3	3	2	2	2	2
2017 Total		**7,109**	**7,127**	**7,105**	**7,112**	**7,193**	**7,248**	**7,314**	**7,265**	**7,304**	**7,319**	**7,335**	**7,320**

Actual Headcount by Month and Year for DEBS Pay Company

Headcount at Month End. Only full time employees, includes temps

		Month											
Year	**Level 4 Dept**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
2018	Admin Svcs & Human Resources	514	522	520	520	537	547	544	542	539	539	542	541
	CEO & Staff	11	11	11	11	11	11	11	11	11	11	11	11
	Distb, Cust Ops & DE Carolina	1,390	1,395	1,375	1,405	1,411	1,416	1,449	1,446	1,468	1,474	1,480	1,455
	Energy Solutions&MW/FL Regions	196	206	228	224	232	232	235	240	244	252	259	276
	Finance & Technology	2,458	2,484	2,510	2,546	2,590	2,621	2,647	2,599	2,600	2,607	2,607	2,610
	Gas Operations	265	267	271	270	294	294	288	288	287	282	281	280
	Generation & Transmission	2,330	2,343	2,355	2,336	2,348	2,377	2,394	2,379	2,390	2,380	2,378	2,362
	Legal, E&C & External Affairs	321	327	306	308	311	310	310	310	309	313	314	319
	Strategy Execution Office	2	2	2	2	2	2	1	1	1	1	1	1
2018 Total		**7,487**	**7,557**	**7,578**	**7,622**	**7,736**	**7,810**	**7,879**	**7,816**	**7,849**	**7,859**	**7,873**	**7,855**
2019	Admin Svcs & Human Resources	529	528	523	518	530	538	537	528	523			
	CEO & Staff	11	11	11	11	11	11	11	11	11			
	Distb, Cust Ops & DE Carolina	1,487	1,499	1,466	1,477	1,481	1,483	1,484	1,485	1,472			
	Energy Solutions&MW/FL Regions	285	289	272	273	274	274	274	272	276			
	Finance & Technology	2,546	2,548	2,516	2,498	2,513	2,504	2,484	2,457	2,469			
	Gas Operations	282	284	284	285	292	294	292	296	299			
	Generation & Transmission	2,367	2,350	2,325	2,303	2,294	2,220	2,186	2,149	2,167			
	Legal, E&C & External Affairs	318	319	347	349	351	353	352	347	349			
2019 Total		**7,825**	**7,828**	**7,744**	**7,714**	**7,746**	**7,677**	**7,620**	**7,545**	**7,566**			

Duke Energy Kentucky
Case No. 2019-00271
Attorney General's First Set Data Requests
Date Received: October 14, 2019

AG-DR-01-044

REQUEST:

Provide the amount of Supplemental Executive Retirement Plan ("SERP") costs included in the test year O&M expenses. Provide the amounts broken down between DEK directly incurred costs and costs allocated separately from each other affiliate.

RESPONSE:

See AG-DR-01-044 Attachment.

PERSON RESPONSIBLE: Renee H. Metzler

44. Provide the amount of Supplemental Executive Retirement Plan ("SERP") costs included in the test year O&M expenses. Provide the amounts broken down between DEK directly incurred costs and costs allocated separately from each other affiliate.

Test period: 4/1/20 - 3/31/21

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
DEK BUDGET for NQ Plans - Direct - 2020	-	-	-	705	705	705	705	705	705	705	705	705	6,343
DEK BUDGET for NQ Plans - Alloc - 2020	-	-	-	9,472	9,472	9,472	9,472	9,472	9,472	9,472	9,472	9,472	85,245
DEK BUDGET for NQ Plans - Direct - 2021	701	701	701	-	-	-	-	-	-	-	-	-	2,103
DEK BUDGET for NQ Plans - Alloc - 2021	9,277	9,277	9,277	-	-	-	-	-	-	-	-	-	27,830
TOTAL DEK BUDGET for NQ Plans - Direct (4/1/20 - 3/31/21)													8,446
TOTAL DEK BUDGET for NQ Plans - Alloc (4/1/20 - 3/31/21)													113,075
TOTAL DEK BUDGET for NQ Plans (4/1/20 - 3/31/21)													121,521

Assumptions:

1) Service and Non Service costs are included in the above numbers

2) Source for numbers = Towers Watson five year financial plan report

3) Direct numbers are calculated based on annual budget for DEK Electric

4) Allocated numbers are calculated based on annual budget for DEBs (using DGEX Allocation % to DEK Electric)

Duke Energy Kentucky
Case No. 2019-00271
Attorney General's First Set Data Requests
Date Received: October 14, 2019

AG-DR-01-045

REQUEST:

Refer to the electronic workpapers provided in response to Staff 1-54 and further to tab BASE PERIOD containing actual and projected monthly revenues and costs by subaccount during the months in the base year. Provide an update for all accounts with actual monthly data through the latest month with available data.

RESPONSE:

See STAFF-DR-01-003 Attachment. Forecasted months will be updated as the actual information becomes available.

PERSON RESPONSIBLE: Sarah E. Lawler

AG-DR-01-046 PUBLIC
AS TO ATTACHMENT ONLY

REQUEST:

Refer to the electronic workpapers provided in response to Staff 1-54 and further to tabs BASE PERIOD and FORECAST PERIOD containing monthly revenues and costs by subaccount. Account 500000 for Supervision and Engineering – Steam Operations increases from $2.657 million in the base year to $3.753 million in the test year for an increase of 41%.

a. Provide an explanation of all known increases in the forecast year costs over the base year costs for this account.

b. Provide the costs recorded in this account for 2017, 2018, and separately for all the months in 2019 with information available.

RESPONSE:

CONFIDENTIAL PROPRIETARY TRADE SECRET (As to Attachment Only)

a. The increase is due to certain costs being in the Base Period in Accounts 510000, 551000, & 920000; however, in the forecast period these charges were inadvertently reflected in Account 500000.

b. Please see PUBLIC AG-DR-01-046 b Attachment 1. The confidential attachment will be provided to all parties upon the execution of a Confidentiality Agreement.

PERSON RESPONSIBLE: Christopher M. Jacobi (a)
Danielle L. Weatherston (b)

CONFIDENTIAL PROPRIETARY TRADE SECRET

Duke Energy Kentucky - Electric Only
Schedule of 0500000 Account Charges
For the Calendar Year 2017

Business Unit Hierarchy	DE_KENTUCKY_ELEC - Duke Energy Kentucky Electric
Account CB	0500000

Account CB - Description	Grand Total	
0500000 - Suprvsn and Engrg - Steam Oper	$	2,503,811.27

CONFIDENTIAL PROPRIETARY TRADE SECRET

Duke Energy Kentucky - Electric Only
Schedule of 0500000 Account Charges
For the Calendar Year 2018

Business Unit Hierarchy	DE_KENTUCKY_ELEC - Duke Energy Kentucky Electric
Account CB	0500000

Account CB - Description	Grand Total	
0500000 - Suprvsn and Engrg - Steam Oper	$	2,467,176.78

CONFIDENTIAL PROPRIETARY TRADE SECRET

Duke Energy Kentucky - Electric Only
Schedule of 0500000 Account Charges
9 months of 2019

Business Unit Hierarchy: DE_KENTUCKY_ELEC - Duke Energy Kentucky Electric
Account CB: 0500000

	2019	2019	2019	2019	2019	2019	2019	2019	2019	Grand Total
	Q1 2019	Q1 2019	Q1 2019	Q2 2019	Q2 2019	Q2 2019	Q3 2019	Q3 2019	Q3 2019	
Account CB - Description	Jan 2019	Feb 2019	Mar 2019	Apr 2019	May 2019	Jun 2019	Jul 2019	Aug 2019	Sep 2019	
0500000 - Suprvsn and Engrg - Steam Oper	$ 192,805.22	$ 197,117.91	$ 236,528.02	$ 373,398.70	$ 209,476.43	$ (74,404.56)	$ [redacted]	$ [redacted]	$ [redacted]	$ 1,683,775.67

REQUEST:

Refer to the electronic workpapers provided in response to Staff 1-54 and further to tabs BASE PERIOD and FORECAST PERIOD containing monthly revenues and costs by subaccount. Account 502100 for Fossil Steam Expense - Other increases from $2.721 million in the base year to $4.511 million in the test year for an increase of 66%.

a. Provide an explanation of all known increases in the forecast year costs over the base year costs for this account.

b. Provide the costs recorded in this account for 2017, 2018, and separately for all the months in 2019 with information available.

RESPONSE:

CONFIDENTIAL PROPRIETARY TRADE SECRET (As to Attachment only)

a. The increase is due to certain costs inadvertently being charged in the Base Period to Account 514000; however, in the Forecast Period, these charges are correctly reflected in Account 502100.

b. Please see AG-DR-01-047(b) Confidential Attachment. The confidential attachment will be provided to all parties upon the execution of a Confidentiality Agreement.

PERSON RESPONSIBLE: Christopher M. Jacobi – a.
Danielle L. Weatherston – b.

CONFIDENTIAL PROPRIETARY TRADE SECRET

Duke Energy Kentucky - Electric Only
Schedule of 0502100 Account Charges
For the Calendar Year 2017

Business Unit Hierarchy	DE_KENTUCKY_ELEC - Duke Energy Kentucky Electric
Account CB	0502100

Account CB - Description	Grand Total	
0502100 - Fossil Steam Exp-Other	$	3,660,922.28

CONFIDENTIAL PROPRIETARY TRADE SECRET

Duke Energy Kentucky - Electric Only
Schedule of 0502100 Account Charges
For the Calendar Year 2018

Business Unit Hierarchy	DE_KENTUCKY_ELEC - Duke Energy Kentucky Electric
Account CB	0502100

Account CB - Description	Grand Total	
0502100 - Fossil Steam Exp-Other	$	2,558,124.18

CONFIDENTIAL PROPRIETARY TRADE SECRET

Duke Energy Kentucky - Electric Only
Schedule of 0502100 Account Charges
9 months of 2019

Business Unit Hierarchy DE_KENTUCKY_ELEC - Duke Energy Kentucky Electric
Account CB 0502100

	2019	2019	2019	2019	2019	2019	2019	2019	2019	Grand Total
	Q1 2019	Q1 2019	Q1 2019	Q2 2019	Q2 2019	Q2 2019	Q3 2019	Q3 2019	Q3 2019	
Account CB - Description	Jan 2019	Feb 2019	Mar 2019	Apr 2019	May 2019	Jun 2019	Jul 2019	Aug 2019	Sep 2019	
0502100 - Fossil Steam Exp-Other	$ 280,285.58	$ (218,351.52)	$ 115,642.77	$ 114,942.01	$ 89,872.18	$ 33,533.34	[redacted]	[redacted]	[redacted]	[redacted]

REQUEST:

Refer to Schedule C-2. Distribution expenses increase from $15.959 million in the base year to $17.848 million in the test year for an increase of 12%.

a. Provide an explanation of all known increases in the forecast year costs over the base year costs for distribution O&M expenses.

b. Provide the total distribution O&M costs recorded for 2017, 2018, and separately for all the months in 2019 with information available.

RESPONSE:

CONFIDENTIAL PROPRIETARY TRADE SECRET (As to Attachment only)

a. The increase in the forecast year distribution O&M expenses over the base year is due to increase in costs related to cable locates, customer installations and vegetation management.

b. See AG-DR-01-048(b) Attachment. The confidential attachment will be provided to all parties upon the execution of a Confidentiality Agreement.

PERSON RESPONSIBLE: Christopher M. Jacobi – a.
Danielle Weatherston – b.

CONFIDENTIAL PROPRIETARY TRADE SECRET

Duke Energy Kentucky - Electric Only
Schedule of Distribution Account Charges
For the Calendar Year 2017

Business Unit Hierarchy — DE_KENTUCKY_ELEC - Duke Energy Kentucky Electric
Account CB GL FERC Account — (Multiple Items)

Account CB - Description	Grand Total	
0580000 - Supervsn and Engring-Dist Oper	$	45,380.58
0581004 - Load Dispatch-Dist of Elec	$	415,686.41
0582100 - Station Expenses-Other-Dist	$	187,321.69
0583100 - Overhead Line Exps-Other-Dist	$	76,416.33
0583200 - Transf Set Rem Reset Test-Dist	$	95,353.16
0584000 - Underground Line Expenses-Dist	$	405,387.37
0586000 - Meter Expenses-Dist	$	837,430.12
0587000 - Cust Install Exp-Other Dist	$	623,309.39
0588100 - Misc Distribution Exp-Other	$	2,431,263.02
0589000 - Rents-Dist Oper	$	(28,172.79)
0591000 - Maintenance Of Structures-Dist	$	4,020.28
0592100 - Maint Station Equip-Other-Dist	$	216,832.56
0592200 - Cir BrkrsTrnsf Mters Rely-Dist	$	97,256.18
0593000 - Maint Overhd Lines-Other-Dist	$	10,909,882.26
0593100 - Right-Of-Way Maintenance-Dist	$	12.44
0594000 - Maint-Underground Lines-Dist	$	621,979.68
0595100 - Maint Line Transfrs-Other-Dist	$	457,602.14
0596000 - Maint-StreetLightng/Signl-Dist	$	458,639.60
0597000 - Maintenance Of Meters-Dist	$	334,384.56
Grand Total	$	18,189,984.98

CONFIDENTIAL PROPRIETARY TRADE SECRET

Duke Energy Kentucky - Electric Only
Schedule of Distribution Account Charges
For the Calendar Year 2018

Business Unit Hierarchy — DE_KENTUCKY_ELEC - Duke Energy Kentucky Electric
Account CB GL FERC Account — (Multiple Items)

Account CB - Description	Grand Total	
0580000 - Supervsn and Engring-Dist Oper	$	116,063.00
0581004 - Load Dispatch-Dist of Elec	$	345,581.10
0582100 - Station Expenses-Other-Dist	$	61,654.14
0583100 - Overhead Line Exps-Other-Dist	$	123,419.55
0583200 - Transf Set Rem Reset Test-Dist	$	69,013.70
0584000 - Underground Line Expenses-Dist	$	318,755.73
0586000 - Meter Expenses-Dist	$	625,332.36
0587000 - Cust Install Exp-Other Dist	$	961,446.74
0588100 - Misc Distribution Exp-Other	$	2,539,530.46
0589000 - Rents-Dist Oper	$	(21,468.90)
0590000 - Supervsn and Engrng-Dist Maint	$	84,316.75
0591000 - Maintenance Of Structures-Dist	$	8,246.91
0592100 - Maint Station Equip-Other-Dist	$	86,193.87
0592200 - Cir BrkrsTrnsf Mters Rely-Dist	$	216,153.16
0593000 - Maint Overhd Lines-Other-Dist	$	3,591,131.13
0593100 - Right-Of-Way Maintenance-Dist	$	4,207,722.35
0594000 - Maint-Underground Lines-Dist	$	268,975.58
0595100 - Maint Line Transfrs-Other-Dist	$	231,010.53
0596000 - Maint-StreetLightng/Signl-Dist	$	352,595.43
0597000 - Maintenance Of Meters-Dist	$	306,149.13
0598100 - Main Misc Dist Plt-Other-Dist	$	6,586.54
Grand Total	$	14,498,409.26

CONFIDENTIAL PROPRIETARY TRADE SECRET

Duke Energy Kentucky - Electric Only
Schedule of Distribution Account Charges
9 months of 2019

Business Unit Hierarchy — DE_KENTUCKY_ELEC - Duke Energy Kentucky Electric
Account CB GL FERC Account — (Multiple Items)

	2019	2019	2019	2019	2019	2019	2019	2019	2019	Grand Total
	Q1 2019	Q1 2019	Q1 2019	Q2 2019	Q2 2019	Q2 2019	Q3 2019	Q3 2019	Q3 2019	
Account CB - Description	Jan 2019	Feb 2019	Mar 2019	Apr 2019	May 2019	Jun 2019	Jul 2019	Aug 2019	Sep 2019	
0580000 - Supervsn and Engring-Dist Oper	$ 5,076.79	$ 10,337.20	$ 8,857.97	$ 12,388.11	$ 8,080.64	$ 9,333.49	[redacted]			
0581004 - Load Dispatch-Dist of Elec	$ 25,997.22	$ 47,579.60	$ 25,996.01	$ 26,082.40	$ 28,261.52	$ 68,165.55				
0582100 - Station Expenses-Other-Dist	$ 1,588.33	$ 1,342.14	$ 1,290.62	$ 2,199.37	$ 2,523.74	$ 964.17				
0583100 - Overhead Line Exps-Other-Dist	$ 276.41	$ -	$ 920.41	$ 9,854.28	$ (19,730.88)	$ 110,146.41				
0583200 - Transf Set Rem Reset Test-Dist	$ 4,359.01	$ 4,422.78	$ 7,452.35	$ 6,049.48	$ 4,311.05	$ 4,071.45				
0584000 - Underground Line Expenses-Dist	$ 32,716.68	$ 3,112.25	$ 21,790.80	$ 21,362.01	$ 9,885.53	$ 78,084.90				
0586000 - Meter Expenses-Dist	$ 28,369.88	$ 28,913.10	$ 52,475.44	$ 37,615.45	$ 41,695.92	$ 50,570.31				
0587000 - Cust Install Exp-Other Dist	$ 63,216.67	$ 60,380.02	$ 70,853.18	$ 49,151.48	$ 55,167.16	$ 72,980.85				
0588100 - Misc Distribution Exp-Other	$ 268,578.12	$ 232,907.83	$ 206,921.96	$ 268,225.02	$ 111,300.48	$ 297,910.74				
0589000 - Rents-Dist Oper	$ 1,928.00	$ 4,365.00	$ (5,555.00)	$ 5,173.20	$ (295.00)	$ (4,645.00)				
0590000 - Supervsn and Engrng-Dist Maint	$ 7,817.06	$ 7,214.92	$ 7,468.99	$ 7,595.43	$ 7,547.66	$ 9,091.94				
0591000 - Maintenance Of Structures-Dist	$ 4.65	$ 262.11	$ -	$ 318.68	$ -	$ -				
0592100 - Maint Station Equip-Other-Dist	$ 5,914.23	$ 6,379.90	$ 20,650.42	$ 1,119.77	$ 5,928.67	$ 4,839.33				
0592200 - Cir BrkrsTrnsf Mters Rely-Dist	$ 26,287.03	$ 26,466.46	$ 31,394.95	$ 21,297.13	$ 28,345.59	$ 14,801.12				
0593000 - Maint Overhd Lines-Other-Dist	$ 274,481.89	$ 315,641.72	$ 495,991.33	$ (9,299.58)	$ 225,186.20	$ 437,817.37				
0593100 - Right-Of-Way Maintenance-Dist	$ 366,996.33	$ 405,614.66	$ 610,134.53	$ 781,394.45	$ 499,764.32	$ 378,274.70				
0594000 - Maint-Underground Lines-Dist	$ 1,071.73	$ 11,015.90	$ 8,399.00	$ (2,463.79)	$ 14,875.81	$ 46,228.23				
0595100 - Maint Line Transfrs-Other-Dist	$ 11,272.62	$ 2,021.09	$ 7,570.56	$ 3,096.04	$ 4,629.43	$ 3,071.77				
0596000 - Maint-StreetLightng/Signl-Dist	$ 22,642.03	$ 11,745.56	$ 27,738.29	$ 46,500.30	$ 5,107.87	$ 56,424.16				
0597000 - Maintenance Of Meters-Dist	$ 22,126.44	$ 23,141.04	$ 32,798.36	$ 32,196.52	$ 28,018.97	$ 24,768.92				
Grand Total	$ 1,170,721.12	$ 1,202,863.28	$ 1,633,150.17	$ 1,319,855.75	$ 1,060,604.68	$ 1,662,900.41				

AG-DR-01-049

REQUEST:

Refer to FR 16(7)(u) Attachment page 7 of 10 showing amounts by year allocated to DEK from DE Carolinas and DE Progress. Define the purpose and origin of the "Generation Capacity" costs and explain why those costs allocated to DEK have increased from $58,191 in 2016 to $399,132 in 2018 and projected to increase to $913,571 during the test year.

RESPONSE:

The purpose of Generating Capacity is to allocate costs for providing management and support services for Duke Energy Corporation's electric generation system. The origin is a ratio based on the total applicable installed megawatt capability for the preceding year. The numerator of which is for a Client Company and the denominator of which is for all Client Companies (and Duke Energy Corporation's non-utility and non-domestic utility affiliates, where applicable). This ratio will be determined annually or when required due to a significant change. This ratio has stayed relatively stable since 2016.

The costs allocated to Duke Energy Kentucky have increased due to an increase in Duke Energy Carolinas employee cost in support of Coal Combustion Products efforts.

Note that the table submitted as part of FR16(7)(u) Attachment, page 7 of 10, was inadvertently not updated to reflect current numbers. See AG-DR-01-049 Attachment for a revised FR16(7)(u), page 4(a) of 5. The table presented had no impact on test period expense.

PERSON RESPONSIBLE: Jeffrey R. Setser

Duke Energy Kentucky
Analysis of Amounts Allocated to Duke Energy Kentucky from DE Carolinas and DE Progress (Utility to Utility allocations)
Summarized by Allocation Basis
Revised FR 16(7) u 4(a) of 5

	Years Ended December 31,				
	2016	2017	2018	Base Period (1)	Forecasted Test Period (2)
Circuit Miles	164,993	258,447	366,197	353,163	202,613
Circuit Miles and Electric Peak Load	18,704	22,276	30,515	20,950	26,630
Construction	87,322	149,221	106,202	59,122	24,154
Customers	794,528	760,061	810,422	739,339	321,464
Electric Peak Load	19,147	17,274	15,304	12,971	18,736
Generation Capacity	399,132	544,348	567,941	890,098	902,506
Sales	11,739	15,960	7,012	2,326	2,294
	$ 1,495,566	$ 1,767,587	$ 1,903,592	$ 2,077,968	$ 1,498,397

(1) Base period represents December 2018 - May 2019 Actuals and June 2019 - November 2019 Budget.
(2) Forecasted test period represents April 2020 - March 2021

REQUEST:

Refer to the DEBS 2018 FERC Form 60 at pages 201, 301, and 302.

a. Refer to the amount of net income after taxes reflected on page 302 at line 62 and the amount of income taxes on page 302 at lines 42-44. Explain how the service company reflected net income of approximately $36.105 million after net income tax expense of approximately $15.407 million in 2018 as opposed to net income and income taxes at around zero if all costs were charged to affiliates at cost.

b. Refer to page 201 at lines 14 and 15. The balance of Unappropriated Retained Earnings at the end of 2018 was approximately $508.533 million and dividends paid during 2018 were $0. Confirm that the amount of Unappropriated Retained Earnings represents profits retained at DEBS, after annual dividends to stockholders, and that those profits represent billings to affiliates in excess of actual costs on a cumulative basis.

c. Are any costs charged to affiliates, such as DEK, based on an equity return on investment component as opposed to just the return of component and interest charges? If so, explain and describe the basis for the equity return added to costs charged to affiliates as well as the actual return on equity percentage added during 2018 and the projected return on equity percentage for the test year.

d. Provide a schedule showing the monthly forecasted net income for DEBS, before and after income taxes, for each month during 2020 and the first three months of 2021.

e. Provide a schedule showing the monthly forecasted recovery of equity return for DEBS, including income taxes, charged to DEK, including charges directly to DEK from DEBS and all charges from other affiliates that include charges from DEBS. Provide all calculations, including electronic spreadsheets in live format with all formulas intact.

RESPONSE:

a. The Service Company charges a return for the use of DEBS assets to the jurisdictions. This represents a cost of capital for assets on the Service Company that are used in the operations of Duke Energy and its subsidiary companies. For 2018, the return on DEBS assets was $51.3 million, income tax expense was $15.4 million, resulting in net income of approximately $35.9 million.

b. The amount of Unappropriated Retained Earnings does represent billings in excess of costs recorded on DEBS ledger on a cumulative basis. The nature of these billings in excess of costs can be categorized into two categories. Prior to the Duke Cinergy merger, which brought Kentucky under Duke Energy Corporation, the legacy Duke Corporation utilized a tax strategy in which the Service Company charged a management fee for services provided. The cost to the utilities, primarily Duke Energy Carolinas, was recorded to a below the line non-utility account. The reorganization associated with the Duke Cinergy merger negated this strategy going forward. The second category is the return on DEBS assets. The Service Company to Utility Service Agreement states that the company shall cover all costs of doing business. Cost as defined in the agreement means "fully embedded costs, namely, the sum of (1) direct

costs, (2) indirect costs and (3) **costs of capital**." The return on DEBS assets is a charge to recover the cost of capital to the utilities for the use of these assets.

c. A return on DEBS assets is recorded based on a monthly calculation of DEBS assets. These assets include PP&E, prepaid pension assets and inventory. The PP&E is determined based on NET PP&E less CWIP less associated deferred taxes. Prepaid pension assets are determined by taking the prepaid qualified pension, less the non-qualified pension and OPEB liabilities and decreasing by a deferred tax amount. The inventory amount is the amount reflected on the inventory balance sheet for DEBS. The total allocated amount of assets assigned to the Regulated Utility is multiplied by a revenue requirement percentage to achieve the allowed rate of return in the jurisdiction. The amount allocated to the utility is based on a 3-factor allocation for PP&E and inventory assets. The pension assets are allocated based on DEBS labor usage. This process is applicable to 2018, 2019 and for the projected test year. The revenue requirement percentage used in Kentucky are based on the 2017 Kentucky Electric rate case for all forecasted periods. See AG-DR-01-050(c) Attachment.

d. See table below:

Period	Before taxes ($000)	After taxes ($000)
Jan-20	4,440	2,894
Feb-20	4,440	2,894
Mar-20	4,440	2,894
Apr-20	4,440	2,894
May-20	4,440	2,894
Jun-20	4,440	2,894
Jul-20	4,440	2,894
Aug-20	4,440	2,894
Sep-20	4,440	2,894
Oct-20	4,440	2,894
Nov-20	4,440	2,894
Dec-20	4,440	2,894
Jan-21	4,481	2,926
Feb-21	4,481	2,926
Mar-21	4,481	2,926

e. Please see AG-DR-01-050(e) Attachment. This file includes multiple worksheets. The first worksheet "DEK Return" shows the monthly values for the forecasted test period for each of the components of the return as well as the total and tax effects. The following 3 worksheets for both 2020 and 2021 are the worksheets used to calculate the monthly values. Each worksheet shows the detailed calculations for the Duke Energy Kentucky electric component of the DEBS return that are linked to the "DEK Return" worksheet.

PERSON RESPONSIBLE: Jeff Setser (a,b,c,e)
Christopher Jacobi (d)

Duke Energy Kentucky, Inc.
Electric Case No. 2017-00321 10/2/2018

Capital Structure (b)						
Long Term Debt	268,420,548	40.977%	4.243%	1.739%	1.000000000	1.74%
Short Term Debt	64,011,655	9.772%	3.083%	0.301%	1.000000000	0.30%
Total Debt	332,432,203	50.749%		2.040%		
Preferred Stock		0.00%	0.00%	0.000%	1.340986600	0.00%
Common Equity	322,619,530	49.251%	9.725%	4.790%	1.340986600	6.42%
Total Jurisdictional Capit	655,051,733	100.00%		6.830%		8.460%
Rate Base	741,429,309					
Operating Income	44,740,032			6.034%		

	Test Period PPE Return			Test Period PEN Return			Test Period INV Return			Total Return			After Tax Return				
4	2020	28,588	4	2020	32,046	4	2020	1,767	4	2020	62,400	4	2020	62,400	34.8%	40,672
5	2020	28,588	5	2020	32,046	5	2020	1,767	5	2020	62,400	5	2020	62,400	34.8%	40,672
6	2020	28,588	6	2020	32,046	6	2020	1,767	6	2020	62,400	6	2020	62,400	34.8%	40,672
7	2020	28,588	7	2020	32,046	7	2020	1,767	7	2020	62,400	7	2020	62,400	34.8%	40,672
8	2020	28,588	8	2020	32,046	8	2020	1,767	8	2020	62,400	8	2020	62,400	34.8%	40,672
9	2020	28,588	9	2020	32,046	9	2020	1,767	9	2020	62,400	9	2020	62,400	34.8%	40,672
10	2020	28,588	10	2020	32,046	10	2020	1,767	10	2020	62,400	10	2020	62,400	34.8%	40,672
11	2020	28,588	11	2020	32,046	11	2020	1,767	11	2020	62,400	11	2020	62,400	34.8%	40,672
12	2020	28,588	12	2020	32,046	12	2020	1,767	12	2020	62,400	12	2020	62,400	34.8%	40,672
1	2021	28,874	1	2021	32,366	1	2021	1,784	1	2021	63,024	1	2021	63,024	34.7%	41,152
2	2021	28,874	2	2021	32,366	2	2021	1,784	2	2021	63,024	2	2021	63,024	34.7%	41,152
3	2021	28,874	3	2021	32,366	3	2021	1,784	3	2021	63,024	3	2021	63,024	34.7%	41,152
		343,910			385,512			21,252			750,674			750,674		489,507

SERVICE COMPANY COST ALLOCATION DETAILS
COST ALLOCATIONS IN SERVICE AGREEMENTS

Function	Function	Allocation Method	Operating Unit	Alloc Pool	St Cd
Facilities Rate of Return Allocation	Allocates the Service Company's portion of	*Three Factor Formula*	DURR	Facilities ROR Gvmce	[illegible]

	DPC 20056 Duke Power Goverence	DEP 50991 DE Progress	DEF 50992 Progress Florida	DEO [illegible]	DEO [illegible]	DEO 75954 DE Ohio [illegible]	DEO	DEK 75957 DE Kentucky (LSFRELG)	DEK 75955 DE Kentucky [illegible]	DEK	DEI 75960	Comm Pwr [illegible]	Comm	Comm Trans [illegible]	Gas Oper [illegible]	Piedmont 47151 Piedmont Gas Del	Other [illegible]	Other [illegible]	Other	Total
Facilities Rate of Return Allocation	35.41%	23.35%	15.93%	0.04%	3.24%	1.59%	4.87%	1.02%	0.35%	1.37%	10.51%	2.99%	2.99%	0.02%	0.02%	5.47%	0.02%	0.04%	0.06%	100.00%
								8.46%												
	12	12	12	12	12	12		12	12		12	12		12	12	12	12	12		
	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		0.71%	0.00%		0.00%	0.00%		0.00%	0.00%	0.00%	0.00%	0.00%		
	GO22	PCGS	PFGS	GO27	GO24	GO25		GO28	GO29		GO31	GO32		SG38	SG39	SG37	GO21	GO34		
	1,120,309	870,679	404,253	1,214	99,180	48,250		28,588	10,726		270,889	94,598		633	633	164,181	633	1,266		2,918

Account #	Res Type	Resp Center	Revenue Requirement (provided by each
0931008 for expense	78000	8000 for expense	
0456949 for income	78000	9957 for income	
		2020 PPE value:	397,548,155

2020 Budget	**34,992**
2020 Inventory	**2,162**
2020 Pension	**12,601**
2020 Return on Assets	**49,956**

SERVICE COMPANY COST ALLOCATION DETAILS
COST ALLOCATIONS IN SERVICE AGREEMENTS

Function	Function	Allocation Method	Operating Unit	Alloc Pool	St Cd	DPC 20056 Duke Power Goverence	DEP 50991 DE Progress	DEF 50992 Progress Florida	DEO	DEO	DEO	DEO	DEK	DEK	DEK	DEI 75960	Comm Pwr	Comm	Comm Trans	Gas Oper	Peidmont 47151 Piedmont gas Del	Other	Other	Others	Total
Facilities Rate of Return Allocation	Allocates the Service Company's portion of	*Three Factor Formula*	DURR	Facilities ROR Gvrnce	[illegible]	35.41%	23.35%	15.93%	0.04%	3.24%	1.59%	4.87%	1.02%	0.35%	1.37%	10.51%	2.99%	2.99%	0.02%	0.02%	5.47%	0.02%	0.04%	0.06%	100.00%
Account #	Res Type	Resp Center		Revenue Requirement (provided by each																					
													6.46%												
						12	12	12	12	12	12		12	12		12	12		12	12	12	12	12		
						0.80%	0.72%	0.64%	0.76%	0.77%	0.76%		0.71%	0.77%		0.65%	0.80%		0.80%	0.80%	0.76%	0.80%	0.80%		
0931008 for expense	78000	8000 for expense																							
0456949 for income	78000	9957 for income				GO22	PCGS	PFGS	GO27	GO24	GO25		GO28	GO29		GO31	GO32		SG38	SG39	SG37	GO21	GO34		
		2020 Inventory value:		24,566,904		69,231	41,445	24,981	75	6,129	2,982		1,767	663		16,740	5,846		39	39	10,146	39	78		180,199
																						2020 Budget			**2,162,389.56**

SERVICE COMPANY COST ALLOCATION DETAILS
COST ALLOCATIONS IN SERVICE AGREEMENTS

SA #	Function	Function	Allocation Method	Operating Unit	Alloc Pool	St Cd	DPC 20056 Duke Power Goverence	DEP 50991 DE Progress	PEF 50992 Progress Florida	DEO 75953 DE Ohio (USFRELGOV)	DEO 75954 DE Ohio (USFRGSOV)	DEO	DEK 75557 DE Kentucky (USFRELG	DEK 75558 DE Kentucky (USFRGS	DEK	DEI 75960	Comm Pwr 75991 Energy Solutions Co Inc	Piedmont 47151 Piedmont	Other 10157 PanEnergy governance	Other	Total
Fac ROA	**Labor Allocation**	Allocates the Service Company's service	*Labor Allocation*				29.50%	18.42%	11.95%	10.94%	4.13%	15.07%	3.11%	1.04%	4.15%	17.44%	1.60%	1.54%	0.32%	1.86%	100.00%
	Account #	Res Type	Resp Center		Revenue Requirement (provided by each								8.46%								
							12	12	12	12	12		12	12		12	12	12	12		
							0.00%	0.00%	0.00%	0.00%	0.00%		0.71%	0.00%		0.00%	0.00%	0.00%	0.00%		
	0931008 for expense	78000	8000 for expense																		
	0456949 for income	78000	9957 for income				GO22	PCGS	PFGS	GO24	GO25		GO28	GO29		GO31	GO32	SG37	GO21		
			2020 Pension value:		**146,158,160**		343,113	194,566	111,491	123,121	46,077		32,046	11,717		165,260	18,611	16,994	3,764		**1,066,759**
																		2020 Budget			**12,801,104.02**

REQUEST:

Refer to the Company's CAM at page 13 that includes the following statement:

By the terms of the Service Company Utility Service Agreement, compensation for any service rendered by the Service Company to its utility affiliates is the fully embedded cost thereof (i.e., the sum of: (i) direct costs; (ii) indirect costs; and (iii) costs of capital), except to the extent otherwise required by Section 482 of the Internal Revenue Code.

a. Describe how the "(iii) costs of capital" is determined by DEBS each period and provide that determination for each month applicable to 2018, 2019, and projected for the test year.

b. Describe the source of the return on equity percentage component utilized by DEBS for the "(iii) costs of capital" for each month applicable to 2018, 2019, and projected for the test year and cite all authorities, if any.

c. Indicate whether the "(iii) costs of capital" includes a gross up for income taxes.

RESPONSE:

a. The return on DEBS assets is based on a monthly calculation of DEBS assets. These assets include PP&E, prepaid pension assets and inventory. The PP&E is determined based on NET PP&E less CWIP less associated deferred taxes. Prepaid pension assets are determined by taking the prepaid qualified pension, less the non-qualified pension and OPEB liabilities and decreasing by a deferred tax amount. The inventory amount

is the amount reflected on the inventory balance sheet for DEBS. The total allocated amount of assets assigned to the Regulated Utility is multiplied by a revenue requirement percentage to achieve the allowed rate of return in the jurisdiction. The amount allocated to the utility is based on a 3-factor allocation for PP&E and inventory assets. The pension assets are allocated based on DEBS labor usage. This process is applicable to 2018, 2019 and for the projected test year.

b. The source of the return on DEBS assets as it relates to the projected years in Kentucky is the revenue requirement based on the 2017 Kentucky Electric rate case. This is applicable for all actual and forecasted periods. See AG-DR-01-050(c) Attachment used in response to AG-DR-01-050(c).

c. Yes, the cost of capital is grossed up for income taxes.

PERSON RESPONSIBLE: Jeffrey R. Setser

AG-DR-01-052

REQUEST:

Refer to Lawler Direct at 9 wherein she discusses the Company's adjustment to "completely exclude all revenue and costs that will flow through the Rider PSM from the calculation of the base rate revenue requirement." Explain why the Company does not propose including these amounts in the base revenue requirement and then using these amounts as a "baseline" in the Rider PSM.

RESPONSE:

The Attorney General's witness raised this issue in the Company's most recent base rate case, Case No. 2017-00321. Ms. Lawler provided rebuttal testimony explaining the rationale for excluding profits from off-system sales from base rates. See the Rebuttal Testimony of Sarah E. Lawler, filed in Case No. 2017-00321, on February 14, 2018.

> "The Company believes maintaining the rather uncomplicated current structure where 100 percent of net off-system sales, and all of the other components of Rider PSM, are handled through the Rider PSM is the most logical and reasonable way to handle the netting of off-system sales. Mr. Kollen's proposal adds an unnecessary layer of confusion and opaqueness to the Rider PSM that does not exist now. The Company's proposal is to essentially continue the process that has been vetted and approved by the Commission for over more than a decade without any prior controversy or even any objection. Should the Commission find that it is necessary to include an amount in base rates, all other components of the formula as recommended by the Company, including the sharing percentages, should

be approved by the Commission. The Rider PSM should then symmetrically track incrementally above and below the amount that is included in base rates." (Lawler Rebuttal, pages 11 through 12).

Of note, the Commission, in its April 13, 2018 Order, approved of the Company's proposed Rider PSM.

PERSON RESPONSIBLE: Sarah E. Lawler

AG-DR-01-053

REQUEST:

Refer to the electronic workpapers provided in response to Staff 1-54 and further to the worksheet tab WPC_2 which contains WPC-2a and WPC-2b showing revenue breakdowns in the base and forecast periods.

a. Provide the calculations and all support for the sales for resale revenues in the base period and in the test year.

b. Explain why the sales for resale revenues decline in the test year compared to the base year by over $4.2 million.

c. Explain in detail what is included in line 14 described as "Provision for Rate Refunds" and why $1.912 million in revenue is included in the base year and $0 is included in the test year. In addition, cite all authorities related to these amounts.

Finally, if determined that an amount should be included in the test year, provide that amount and explain how it was determined.

RESPONSE:

a. See AG-DR-01-053(a) Attachment, for support of "sales for resale" shown on WPC-2a and WPC-2b. These amounts have been eliminated from the test period on Schedule D-2.20.

b. As discussed in the AG-DR-01-053(a) Attachment, certain amounts included in the actual months of the base period are not included in the forecasted test period. In addition, there are no projected sales for resale in April 2020 due to planned maintenance outages.

c. The $1,911,969 described as "Provision for Rate Refunds" represents amounts due to customers for off-system sales. The entire amount is related to the actual months of the base period. It is not necessary to include any amounts in the test year because it would have been eliminated on Schedule D-2.20 since it is non-native.

PERSON RESPONSIBLE: Christopher M. Jacobi – a., b.
Sarah E. Lawler – c.

Duke Energy Kentucky, Inc.
Sales for Resale

Account	Account Description	Product		December 2018 Actual	January 2019 Actual	February 2019 Actual	March 2019 Actual	April 2019 Actual	May 2019 Actual	June 2019 Projected	July 2019 Projected	August 2019 Projected	September 2019 Projected	October 2019 Projected	November 2019 Projected	Base Period
447150	Sales For Resale - Outside	CAPCTY	(1)	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
		FACASM	(2)	(28,731.00)	(25,391.00)	23,866.00	19,770.00	20,453.00	14,260.00	0.00	0.00	0.00	0.00	0.00	0.00	24,227.00
		FER668	(3)	2,286,911.00	0.00	0.00	1,151,187.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3,438,098.00
		SLSRSL	(4)	1,737,750.00	875,343.00	174,644.00	1,056,634.00	(193,281.00)	743,156.00	232,933.00	443,098.00	127,774.00	364,214.00	944,542.00	612,610.00	7,119,417.00
447150 Total				3,995,930.00	849,952.00	198,510.00	2,227,591.00	(172,828.00)	757,416.00	232,933.00	443,098.00	127,774.00	364,214.00	944,542.00	612,610.00	10,581,742.00

Account	Account Description	Product		April 2020 Projected	May 2020 Projected	June 2020 Projected	July 2020 Projected	August 2020 Projected	September 2020 Projected	October 2020 Projected	November 2020 Projected	December 2020 Projected	January 2021 Projected	February 2021 Projected	March 2021 Projected	Forecasted Period
447150	Sales For Resale - Outside	CAPCTY	(1)	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
		FACASM	(2)	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
		FER668	(3)	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
		SLSRSL	(4)	0.00	68,858.00	74,100.00	538,534.00	42,018.00	519,069.00	487,096.00	285,396.00	406,715.00	1,707,519.00	1,131,354.00	1,100,071.00	6,360,730.00
447150 Total				0.00	68,858.00	74,100.00	538,534.00	42,018.00	519,069.00	487,096.00	285,396.00	406,715.00	1,707,519.00	1,131,354.00	1,100,071.00	6,360,730.00

(1) Represents the net of all capacity transactions invoiced by PJM. These transactions are budgeted to account 555, not account 447 and therefore not included in Sales for Resale in the projected months of the base period and the forecasted test period.
(2) Represents the Ancillary services PJM billing line items recorded to account 447. No amounts were included in the projected months of the base period and the forecasted test period.
(3) An accounting entry required by FERC 668 order. These amounts are offset in account 555 with zero margin impact and therefore not budgeted.
(4) Represents sales of excess generation to PJM

AG-DR-01-054

REQUEST:

Describe in detail how the Company allocates fuel expense between off-system sales and native load. Provide a copy of all documentation of this allocation methodology.

RESPONSE:

The primary tool used to allocate Duke Energy Kentucky fuel expense between off-system sales (non-native sales) and native load is a production costing model, Sumatra, which is jointly supported by Power Costs, Inc., and Duke Energy information technology resources. The model incorporates generator information such as heat rates, emission rates, generating unit fuel costs, emissions allowance costs, and variable operating and maintenance costs. This is the same data used in the Energy Cost Manual, which is also the basis for the supply offers to PJM. We also include as inputs to the model actual hourly data, including native load demand, generating unit output (*i.e.*, megawatt-hour generation) from PJM, and actual native load purchased power information from the billing system.

Sumatra then "economically dispatches" or matches, on an hourly basis, the demand (load) with available supply resources (*i.e.*, generation or purchases) that are economically "stacked," *i.e.*, generally prioritized based on production costs, lowest cost to highest cost. Consequently, the Sumatra model economically allocates the production costs for serving native load with units on-line for testing assigned to native load.

All the Company's generating resources are generally included as available resources in this process. Post-analysis data includes information such as actual unit forced and maintenance outages. In recognition that the PJM day-ahead and real-time markets are separate markets (for both energy and ancillary services) we also restrict the availability of certain specific generating capacity that cleared in the day-ahead market for non-native demand.

The day-ahead energy market generation awards from PJM are stacked against the day-ahead load cleared by PJM, providing Duke Energy Kentucky native customers first call on the lowest cost generation in the day-ahead market. Generation that clears day-ahead in excess of day-ahead load is committed to day ahead non-native sales. Then, utilizing the actual real-time generation and load, everything is restacked, and Duke Energy Kentucky native customers are assigned the lowest cost generation that did not clear for non-native in the day ahead, but was dispatched in the real-time energy market. If Duke Energy Kentucky's real-time native load is greater than the available real-time generation not committed in the day ahead energy market to non-native, then Duke Energy Kentucky will purchase energy from PJM to make-up the difference. If Duke Energy Kentucky's real-time native load is less than the available real-time generation not committed in the day-ahead market to non-native, then any excess generation is considered as a real-time non-native energy market sale. All costs associated with generators that clear day ahead for non-native energy market sales or in real-time for non-native energy market sales are assigned to a non-native cost allocation. Duke Energy Kentucky native customers will only pay for fuel and/or PJM charges associated with the units that are assigned to them.

PERSON RESPONSIBLE: John Verderame

AG-DR-01-055

REQUEST:

Refer to the electronic workpapers provided in response to Staff 1-54 and further to tabs BASE PERIOD and FORECAST PERIOD containing monthly revenues and costs by subaccount. Refer further to the revenues reflected in account 456025 described as "RSG Rev - MISO Make Whole." Describe the source of these revenues in the base year and explain why none are projected for the test year. In addition, describe if these revenues are reflected in a separate rider instead of base rates.

RESPONSE:

The actual amounts recorded in Account 456025 are related to PJM billing line items 2370, Day-ahead Operating Reserve Credit; and 2375, Balancing Operating Reserve. These billing line items are to ensure that generation owners are fully compensated for any generator that is instructed to run by PJM. Thus, these payments are received by the Company from PJM when revenues received from the market didn't fully compensate the cost to run the generator as defined by the unit's offer. The Company's forecasting model does not forecast generating units running in a situation when they are uneconomic to operate and thus, for budgeting purposes, the Company assumes that these amounts are zero. These PJM billing line items are included in Rider FAC and Rider PSM as "net fuel related RTO billing line items."

PERSON RESPONSIBLE: Christopher M. Jacobi
John Verderame

AG-DR-01-056

REQUEST:

Refer to the electronic workpapers provided in response to Staff 1-54 and further to tabs BASE PERIOD and FORECAST PERIOD containing monthly revenues and costs by subaccount. Refer further to the revenues reflected in account 456111 described as "Other Transmission Revenues." Describe the source of these revenues in the base year and explain why none are projected for the test year. In addition, describe if these revenues are reflected in a separate rider instead of base rates.

RESPONSE:

These revenues in the base period are related to FTR revenues in the actual months and the source is the PJM invoice. Per the Commission's order in Case No. 2017-00321, FTR revenues are included in Rider FAC or Rider PSM as net fuel related billing line items. Therefore, there are no revenues included in the test year for FTRs.

PERSON RESPONSIBLE: Sarah E. Lawler

AG-DR-01-057

REQUEST:

Indicate whether DEK is a C corporation for federal income tax purposes. If not, then describe DEK's entity status for federal income tax purposes.

RESPONSE:

Duke Energy Kentucky is a C corporation for federal income tax purposes. As per tax sharing agreement, Duke Energy and its members (DEK, DEO) file a U.S. consolidated federal income tax return as a common parent.

PERSON RESPONSIBLE: John Panizza

AG-DR-01-058

REQUEST:

Indicate whether DEO is a C corporation for federal income tax purposes. If not, then describe DEO's entity status for federal income tax purposes.

RESPONSE:

DEO is a C corporation for federal income tax purposes. As per tax sharing agreement, Duke Energy and its members (DEK, DEO) file a U.S. consolidated federal income tax return as a common parent.

PERSON RESPONSIBLE: John Panizza

Duke Energy Kentucky
Case No. 2019-00271
Attorney General's First Set Data Requests
Date Received: October 14, 2019

PUBLIC AG-DR-01-059
(As to Attachment only)

REQUEST:

Provide a copy of DEK's 2018 federal income tax returns.

RESPONSE:

CONFIDENTIAL PROPRIETARY TRADE SECRET (As to Attachment only)

Please see AG-DR-01-059 Confidential Attachment. This confidential attachment will be provided to all parties upon the execution of a Confidentiality Agreement.

PERSON RESPONSIBLE: John Panizza

2019-00271

AG-DR-01-059 CONFIDENTIAL ATTACHMENT IS BEING FILED UNDER SEAL

AG-DR-01-060

REQUEST:

Provide a copy of DEO's 2018 federal income tax returns.

RESPONSE:

Objection. Overbroad and irrelevant. This request is beyond the scope of reasonable discovery and is not likely to lead to the discovery of admissible or relevant evidence. The tax returns of Duke Energy Ohio have no bearing on Duke Energy Kentucky's application. Without waiving said objection, and to the extent discoverable, the Company would agree to make the tax returns of Duke Energy Ohio available for inspection at the Company's offices in Frankfort at a mutually agreeable and reasonable time and date.

PERSON RESPONSIBLE: As to objection, Legal
John Panizza

Duke Energy Kentucky
Case No. 2019-00271
Attorney General's First Set Data Requests
Date Received: October 14, 2019

AG-DR-01-061

REQUEST:

Provide a copy of Duke Energy's 2018 federal income tax returns.

RESPONSE:

Objection. Overbroad and irrelevant. This request is beyond the scope of reasonable discovery and is not likely to lead to the discovery of admissible or relevant evidence. The tax returns of Duke Energy Corp have no bearing on Duke Energy Kentucky's application. Without waiving said objection, and to the extent discoverable, the Company would agree to make the tax returns of Duke Energy Kentucky available for inspection at the Company's offices in Frankfort at a mutually agreeable and reasonable time and date.

PERSON RESPONSIBLE: As to objection, Legal
John Panizza

AG-DR-01-062

REQUEST:

Provide a copy of Duke Energy, DEO, and DEK's income tax allocation agreement(s).

RESPONSE:

Please see AG-DR-01-062 Attachment.

PERSON RESPONSIBLE: John Panizza

DUKE ENERGY CORPORATION AND CONSENTING MEMBERS OF ITS CONSOLIDATED GROUP

AGREEMENT FOR FILING CONSOLIDATED INCOME TAX RETURNS AND FOR ALLOCATION OF CONSOLIDATED INCOME TAX LIABILITIES AND BENEFITS

Duke Energy Corporation, a Delaware corporation ("Duke Energy"), and its Members hereby agree as of July 2, 2012 to join annually in the filing of a consolidated Federal income tax return and to allocate the consolidated Federal income tax liabilities and benefits among the Members of the Consolidated Group in accordance with the provisions of this Agreement ("Agreement"). This Agreement supersedes and replaces in its entirety the Agreement for Filing Consolidated Income Tax Returns and for Allocation of Consolidated Income and Tax Liabilities and Benefits dated October 1, 2008.

1. DEFINITIONS

"Affiliate" means a corporation, or a company that is treated as a corporation or a company wholly owned by an entity treated as a corporation that is disregarded for purposes of U.S. federal income taxation, other than the common parent which is a Member of the Affiliated Group.

"Affiliated Group" means a group of corporations, or companies that are treated as corporations or disregarded for purposes of U.S. federal income taxation, as defined in Internal Revenue Code ("IRC") section 1504 and the regulations enacted thereunder,

"Consolidated Group" means a group filing (or required to file) consolidated returns for the tax year.

"Consolidated tax" is the aggregate current Federal income tax liability for the Consolidated Group for a tax year shown on the consolidated Federal income tax return, including any adjustments thereto, or as described in section 5 hereof.

"Corporate taxable income" is the positive taxable income of an Affiliate for a tax year, computed as though such company had filed a separate return on the same basis as used in the consolidated return, except that dividend income from Affiliates shall be disregarded, and other intercompany transactions, eliminated in consolidation, shall be given appropriate effect.

"Corporate taxable loss" is the taxable loss of an Affiliate for a tax year, computed as though such entity had filed a Separate return on the same basis as used in the consolidated return, except that dividend income from

Affiliates shall be disregarded, and other intercompany transactions, eliminated in consolidation, shall be given appropriate effect.

"Corporate tax credit" is a negative separate regular tax of an Affiliate for a tax year, equal to the amount by which the consolidated regular tax is reduced by including the Corporate taxable loss of such Affiliate in the consolidated tax return.

"Environmental Tax" The Superfund Amendments and Reauthorization Act of 1986 imposed a new Environmental Tax. The tax was imposed only for the years beginning after December 31, 1986 and before January 1, 1996. The environmental tax was equal to 0.12 percent ($12 of tax per $10,000 of alternative minimum taxable income ("AMTI")) of the excess of AMTI over $2,000,000 and was imposed whether or not the taxpayer was subject to the alternative minimum tax. The Environmental Tax is included in this Agreement for the purposes of any refund on liability with respect to those years when it was in effect.

"Group" means a group of Affiliates as defined in IRC section 1504.

"Separate return" is the tax liability calculated on the taxable income or loss of an Affiliate as though such entity were not a Member of a Consolidated Group.

"Member" is an Affiliate, including a Regulated Business as indicated in section 3 herein, which is part of the Affiliated Group as defined in IRC section 1504 that files consolidated tax returns and agrees to be subject to this Agreement.

These definitions shall apply, as appropriate, in the context of the regular income tax and the Alternative Minimum Tax ("AMT") unless otherwise indicated in the Agreement.

2. FILING OF RETURNS

A U.S. consolidated federal income tax return shall be filed by Duke Energy as the common parent for the tax year ended December 31, 2008, and for each subsequent taxable period for which the Affiliated Group is required or permitted to do so. Each Member of the Affiliated Group consents to the filing by Duke Energy of consolidated federal income tax returns for all taxable periods in which it is eligible to be a member of the Affiliated Group. Duke Energy and each Member of the Affiliated Group agrees to execute and file such consents, elections and other documents, and to take such other action as may be necessary, required or appropriate for the proper filing of such returns. Duke Energy will timely pay the Affiliated Group's federal income tax liability for each taxable year.

3. REGULATED BUSINESSES OPERATING IN LLC OR LP FORM

For purposes of allocating the consolidated federal and state tax liabilities and tax benefits under this Agreement, each business operating as a LLC, or LP that is subject to the rules and regulations of the Federal Energy Regulatory Commission or state utilities commissions (hereinafter, a "Regulated Business") shall be considered a Member of the Consolidated Group, and shall be responsible for tax due on its allocable share of taxable income (or shall be entitled to a credit for its allocable share of tax loss), as set forth in Sections 4 through 7 hereof. For purposes of this Agreement, the determination of a Regulated Business's allocable share shall be made (i) as if such Regulated Business was a taxable or regarded entity for U.S. federal income tax purposes and (ii) utilizing the separate "taxable income" method.

4. ALLOCATION PROCEDURES FOR CONSOLIDATED FEDERAL INCOME TAXES

For all taxable periods, Duke Energy shall calculate the consolidated federal income tax liability (including, if applicable, alternative minimum tax liability) of the Affiliated Group for the period. The Members agree that their respective shares of the Consolidated tax liability for each year shall be an amount equal to the amount determined under the income method in accordance with IRC 1552(a)(2)[1], with the absorption of tax benefits determined under the percentage method in accordance with Treas. Reg. section 1.1502-33(d)(3)[2], using 100% as the applicable percentage for allocation of any excess of a member's Separate return liability over that determined under the income method. To the extent that the Consolidated Group federal income tax liability is reduced by a loss or tax credit available to it as a result of the inclusion of a Member in the consolidated federal income tax return, Duke Energy shall make a payment or an inter-company account adjustment for the amount of the benefit to the Member as determined in accordance with this section.

To illustrate the above, the Consolidated tax liability shall be allocated among the Members of the Group utilizing the separate return "taxable income" allocation method attributable to each Member, in the following manner:

a) Each Member, which has a Corporate taxable loss, will be entitled to a Corporate payment or intercompany credit equal to the amount by which the consolidated regular income tax is reduced by including the corporate tax loss of such Member in the consolidated tax return.

[1] Under IRC 1551(a)(2), tax liability is allocated to the several members of the group on the basis of the percentage of the total tax which the tax of such member if computed on a separate return would bear to the total amount of the taxes for all members of the group so computed.

[2] The percentage method under this regulation "allocates tax liability based on the absorption of tax attributes, without taking into account the ability of any member to subsequently absorb its own tax attributes. The allocation under this method is in addition to the allocation under section 1552."

The Members having corporate taxable income will be allocated an amount of regular income tax liability equal to the sum of the consolidated regular tax liability and the Corporate tax credits allocated to the Members having corporate tax losses based on the ratio that each such Member's Corporate taxable income bears to the total corporate taxable income of all Members having Corporate taxable income.

If the aggregate of the Members' Corporate taxable losses are not entirely utilized on the current year's consolidated return, the consolidated carryback or carryforward of such losses to the applicable taxable year(s) will be allocated to each Member having a Corporate taxable loss in the ratio that such Member's separate Corporate tax loss bears to the total corporate tax losses of all Members having Corporate taxable losses.

b) The consolidated Environmental Tax will be allocated among the Members of the Group by applying the procedures set forth in subsection a) above, except that the basis for allocation will be Alternative Minimum Taxable Income ("AMTI") rather than regular corporate taxable income.

c) The consolidated AMT will be allocated among the Members in accordance with the procedures and principles set forth in Proposed Treasury Regulation section 1.1502-55 in the form such Regulation existed on the date on which this Agreement was executed.

d) Tax benefits such as general business credits, foreign tax benefits, or other tax credits shall be apportioned directly to those Members whose investments or contributions generated the credit or benefit.

If the credit or benefit cannot be entirely utilized to offset current Consolidated tax, the consolidated credit carryback or carryforward shall be apportioned to those Members whose investments or contributions generated the credit or benefit in proportion to the relative amounts of credits or benefits generated by each Member.

e) If the amount of Consolidated tax allocated to any Member under this Agreement, as determined above, exceeds the separate return tax of such Member, such excess shall be reallocated among those Members whose allocated tax liability is less than the amount of their respective separate return tax liabilities. The reallocation shall be proportionate to the respective reductions in separate return tax liability of such Members. Any remaining unallocated tax liability shall be assigned to Duke Energy. The term "tax" and "tax liability" used in the subsection shall include regular tax, Environmental Tax and AMT.

5. TAX PAYMENTS AND COLLECTIONS FOR ALLOCATIONS

Duke Energy shall make any calculations on behalf of the Members necessary to comply with the estimated tax provisions of the Internal Revenue Code of 1986 as amended (the "Code"). Based on such calculations, Duke Energy shall charge or refund to the Members appropriate amounts at intervals consistent with the dates indicated by Code section 6655. Duke Energy shall be responsible for paying to the Internal Revenue Service the consolidated current Federal income tax liability.

After filing the consolidated Federal income tax return and allocating the Consolidated tax liability among the Members, Duke Energy and the Members agree to settle between them the difference, if any, between the allocable federal income tax liability as determined under this Agreement and the sum of all payments or inter-company adjustments previously made relating to that tax year no later than ninety (90) days after the filing of the consolidated Federal income tax return.

6. ALLOCATION OF STATE TAX LIABILITIES OR BENEFITS

State and local income tax liabilities will be allocated, where appropriate, among Members in accordance with principles similar to those employed in the Agreement for the allocation of consolidated Federal income tax liability.

7. TAX RETURN ADJUSTMENTS

In the event the consolidated tax return is subsequently adjusted by the Internal Revenue Service, state tax authorities, amended returns, claims for refund, or otherwise, such adjustments shall be reflected in the same manner as though they had formed part of the original consolidated return. Interest paid or received, and penalties imposed on account of any adjustment will be allocated to the responsible Member.

8. NEW MEMBERS

If, at any time, a corporation becomes a Member of the affiliated group, the parties hereto agree that such new Member shall become a party to this Agreement by executing a duplicate copy of this Agreement. Unless otherwise specified, such new Member shall have similar rights and obligations of all other Members under this Agreement, effective as of the day they become a member of the Affiliated Group that elects to file a consolidated return.

9. MEMBERS LEAVING THE AFFILIATED GROUP

In the event that any Member of the Affiliated Group at any time leaves the

Group and, under any applicable statutory provision or regulation, that Member is assigned and is deemed to take with it all or a portion of any of the tax attributes (including, but not limited to, net operating losses, credit carryforwards, and Minimum Tax Credit carryforwards) of the Affiliated Group, then, to the extent the amount of the attributes so assigned differs from the amount of such attributes previously allocated to such Member under this Agreement, the leaving Member shall appropriately settle with the Group. Such settlement shall consist of payment on a dollar-for-dollar basis for all differences in credits and, in the case of net operating loss differences, in an amount computed by reference to the highest marginal corporate tax rate. The settlement amounts shall be allocated among the remaining Members of the Group in proportion to the relative level of attributes possessed by each Member and the attributes of each Member shall be adjusted accordingly.

10. SUCCESSORS, ASSIGNS

The provisions and terms of the Agreement shall be binding on and inure to the benefit of any successor or assignee by reason of merger, acquisition of assets, or otherwise, of any of the Members hereto.

11. AMENDMENTS AND TERMINATION

This Agreement may be amended at any time by the written agreement of the parties hereto at the date of such amendment and may be terminated at any time by the written consent of all such parties.

12. GOVERNING LAW

This Agreement is made under the law of the State of Delaware, which law shall be controlling in all matters relating to the interpretation, construction, or enforcement hereof.

13. EFFECTIVE DATE

This Agreement is effective for the allocation of the current Federal income tax liabilities of the Members for the consolidated tax year 2012 and all subsequent years until this Agreement is revised in writing.

The above procedure for apportioning the consolidated annual net current federal and state tax liabilities and tax benefits of Duke Energy and consenting Members of its Consolidated Group have been agreed to by each of the below listed Members of the Consolidated Group as evidenced by the signature of an officer of each entity.

IN WITNESS WHEREOF, each of the parties hereto has caused this Agreement to be executed on its behalf by an appropriate officer thereunto duly authorized.

DUKE ENERGY CORPORATION.

By: _____
Nancy M. Wright
Assistant Corporate Secretary

CINERGY CORP.

By: _____
Nancy M. Wright
Assistant Corporate Secretary

DUKE ENERGY BUSINESS SERVICES LLC

By: _____
Nancy M. Wright
Assistant Secretary

DUKE ENERGY OHIO, INC.

By: _____
Nancy M. Wright
Assistant Corporate Secretary

DUKE ENERGY INDIANA, INC.

By: _____
Nancy M. Wright
Assistant Corporate Secretary

SOUTH CONSTRUCTION COMPANY, INC.

By: _____
Nancy M. Wright
Assistant Secretary

DUKE ENERGY KENTUCKY, INC.

By: _____
Nancy M. Wright
Assistant Corporate Secretary

DUKE ENERGY CAROLINAS, LLC

By: Nancy M Wright
Nancy M. Wright
Assistant Secretary

MIAMI POWER CORPORATION

By: Nancy M Wright
Nancy M. Wright
Assistant Corporate Secretary

TRI-STATE IMPROVEMENT COMPANY

By: Nancy M Wright
Nancy M. Wright
Assistant Corporate Secretary

KO TRANSMISSION COMPANY

By: Nancy M Wright
Nancy M. Wright
Assistant Secretary

CINERGY INVESTMENTS, INC.

By: Nancy M Wright
Nancy M. Wright
Assistant Corporate Secretary

CINERGY TECHNOLOGY, INC.

By: Nancy M Wright
Nancy M. Wright
Assistant Secretary

DUKE ENERGY COMMERCIAL ENTERPRISES, INC.

By: Nancy M Wright
Nancy M. Wright
Assistant Corporate Secretary

CINERGY GLOBAL POWER, INC.

By: Nancy M Wright
Nancy M. Wright
Assistant Secretary

CINERGY GLOBAL RESOURCES, INC.

By: Nancy M Wright
Nancy M. Wright
Assistant Corporate Secretary

DUKE ENERGY COMMERCIAL ASSET MANAGEMENT, INC.

By: Nancy M Wright
Nancy M. Wright
Assistant Corporate Secretary

DUKE TECHNOLOGIES, INC.

By: Nancy M Wright
Nancy M. Wright
Assistant Secretary

DUKE ENERGY RETAIL SALES, LLC

By: Nancy M Wright
Nancy M. Wright
Assistant Secretary

DE NUCLEAR ENGINEERING, INC.

By: Nancy M Wright
Nancy M. Wright
Assistant Secretary

DETMI MANAGEMENT, INC.

By: Nancy M Wright
Nancy M. Wright
Assistant Corporate Secretary

DUKE ENERGY MARKETING AMERICA, LLC

By: Nancy M Wright
Nancy M. Wright
Assistant Secretary

DUKE ENERGY REGISTRATION SERVICES, INC.

By: Nancy M Wright
Nancy M. Wright
Assistant Secretary

DUKE ENERGY SERVICES, INC.

By: Nancy M Wright
Nancy M. Wright
Assistant Corporate Secretary

DUKE VENTURES, LLC

By: Nancy M Wright
Nancy M. Wright
Assistant Secretary

DUKENET VENTURECO, INC.

By: Nancy M Wright
Nancy M. Wright
Assistant Corporate Secretary

EASTOVER MINING COMPANY

By: Nancy M Wright
Nancy M. Wright
Assistant Secretary

DUKE ENERGY CHINA CORP.

By: Nancy M Wright
Nancy M. Wright
Assistant Corporate Secretary

Duke Energy Corporate Services, Inc.

By: Nancy M Wright
Nancy M. Wright
Assistant Secretary

Progress Energy, Inc.

By: Nancy M Wright
Nancy M. Wright
Assistant Corporate Secretary

Carolina Power & Light Company d/b/a Progress Energy Carolinas, Inc.

By: Nancy M Wright
Nancy M. Wright
Assistant Secretary

Florida Power Corporation d/b/a Progress Energy Florida, Inc.

By: _____
Nancy M. Wright
Assistant Secretary

CaroFund, Inc.
(by its parent, Carolina Power & Light Company)

By: _____
Nancy M. Wright
Assistant Secretary

Capitan Corporation
(by its parent, Carolina Power & Light Company)

By: _____
Nancy M. Wright
Assistant Secretary

Progress Energy EnviroTree, Inc.
(by its parent, Carolina Power & Light Company)

By: _____
Nancy M. Wright
Assistant Secretary

Strategic Resource Solutions Corp.
(by its parent company Progress Energy, Inc.)

By: _____
Nancy M. Wright
Assistant Secretary

Progress Ventures Holdings, Inc.
(by its parent, Progress Energy, Inc.)

By: _____
Nancy M. Wright
Assistant Secretary

Progress Ventures, Inc.
(by its parent, Progress Energy, Inc.)

By: _____
Nancy M. Wright
Assistant Secretary

Florida Progress Corporation

By: _____
Nancy M. Wright
Assistant Secretary

Florida Progress Funding Corporation

By: _____
Nancy M. Wright
Assistant Secretary

Progress Capital Holdings, Inc.
(by its parent, Florida Progress Corporation)

By: _____
Nancy M. Wright
Assistant Secretary

PIH, Inc.
(by its parent, Progress Capital Holdings, Inc.)

By: _____
Nancy M. Wright
Assistant Secretary

PIH Tax Credit Fund III, Inc.
(by its parent, Progress Capital Holdings, Inc.)

By: _____
Nancy M. Wright
Assistant Secretary

PIH Tax Credit Fund IV, Inc.
(by its parent, Progress Capital Holdings, Inc.)

By: _____
Nancy M. Wright
Assistant Secretary

PIH Tax Credit Fund V, Inc.
(by its parent, Progress Capital Holdings, Inc.)

By: _____
Nancy M. Wright
Assistant Secretary

Progress Telecommunications Corporation
(by its parent, Progress Capital Holdings, Inc.)

By: _____
Nancy M. Wright
Assistant Secretary

Progress Fuels Corporation

By: _____
Nancy M. Wright
Assistant Secretary

Progress Synfuel Holdings, Inc.
(by its parent, Progress Fuel Corporation)

By: _____
Nancy M. Wright
Assistant Secretary

DUKE COMMUNICATIONS HOLDINGS, INC.

By: _____
Richard G. Beach
Assistant Secretary

DUKE ENERGY GENERATION SERVICES HOLDING COMPANY, INC.

By: _____
Richard G. Beach
Assistant Secretary

DUKE-CADENCE, INC.

By: _____
Richard G. Beach
Assistant Secretary

CINERGY-CENTRUS COMMUNICATIONS, INC.

By: _____
Richard G. Beach
Assistant Secretary

CINERGY-CENTRUS, INC.

By: _____
Richard G. Beach
Assistant Secretary

CINERGY GLOBAL HOLDINGS, INC.

By: _____
Richard G. Beach
Secretary

DEGS OF TUSCOLA, INC

By: _____
Richard G. Beach
Assistant Secretary

DUKE ENERGY ONE, INC.

By: _____
Richard G. Beach
Assistant Secretary

DUKE–RELIANT RESOURCES, INC.

By:_____
Richard G. Beach
Assistant Secretary

DUKE ENERGY GENERATION SERVICES, INC.

By:_____
Richard G. Beach
Assistant Secretary

CINERGY WHOLESALE ENERGY, INC.

By:_____
Richard G. Beach
Assistant Secretary

CINERGY CLIMATE CHANGE INVESTMENTS, LLC

By:_____
Richard G. Beach
Assistant Secretary

CINERGY SOLUTIONS - UTILITY, INC.

By:_____
Richard G. Beach
Assistant Secretary

CALDWELL POWER COMPANY

By:_____
Richard G. Beach
Assistant Secretary

CATAWBA MANUFACTURING AND ELECTRIC POWER COMPANY

By:_____
Richard G. Beach
Assistant Secretary

CLAIBORNE ENERGY SERVICES, INC.

By:_____
Richard G. Beach
Assistant Secretary

DIXILYN-FIELD DRILLING COMPANY

By: _____
Richard G. Beach
Assistant Secretary

DUKE ENERGY MARKETING CORP.

By: _____
Richard G. Beach
Assistant Secretary

EASTOVER LAND COMPANY

By: _____
Richard G. Beach
Assistant Secretary

ENERGY PIPELINES INTERNATIONAL COMPANY

By: _____
Richard G. Beach
Assistant Secretary

GREENVILLE GAS AND ELECTRIC LIGHT AND POWER COMPANY

By: _____
Richard G. Beach
Assistant Secretary

SOUTHERN POWER COMPANY

By: _____
Richard G. Beach
Assistant Secretary

WESTERN CAROLINA POWER COMPANY

By: _____
Richard G. Beach
Assistant Secretary

WATEREE POWER COMPANY

By: _____
Richard G. Beach
Assistant Secretary

DUKE ENERGY TRANSMISSION HOLDING COMPANY, LLC

By: _____
Richard G. Beach
Assistant Secretary

Catamount Energy Corporation

By: _____
Richard G. Beach
Assistant Secretary

Catamount Rumford Corporation

By: _____
Richard G. Beach
Assistant Secretary

Catamount Sweetwater Corporation

By: _____
Richard G. Beach
Assistant Secretary

CEC UK1 Holding Corp.

By: _____
Richard G. Beach
Assistant Secretary

CEC UK2 Holding Corp.

By: _____
Richard G. Beach
Assistant Secretary

Equinox Vermont Corporation

By: _____
Richard G. Beach
Assistant Secretary

DUKE ENERGY GROUP HOLDINGS, LLC

By:_____
Donna T. Council
Assistant Treasurer

DUKE PROJECT SERVICES, INC.

By:_____
Donna T. Council
Assistant Treasurer

PANENERGY CORP

By:_____
Donna T. Council
Assistant Treasurer

CINERGY RETAIL POWER GENERAL, INC.

By:_____
Greer E. Mendelow
Assistant Secretary

BISON INSURANCE COMPANY LIMITED

By:_____
Swati V. Daji
President

NORTHSOUTH INSURANCE COMPANY LIMITED

By:_____
Swati V. Daji
President

Catamount Energy Corporation

By: _____ Date: March 5, 2009
Richard G. Beach
Assistant Secretary

Catamount Heartlands Corporation

By: _____ Date: March 5, 2009
Richard G. Beach
Assistant Secretary

Catamount Rumford Corporation

By: _____ Date: March 5, 2009
Richard G. Beach
Assistant Secretary

Catamount Sweetwater Corporation

By: _____ Date: March 5, 2009
Richard G. Beach
Assistant Secretary

CEC UK1 Holding Corporation

By: _____ Date: March 5, 2009
Richard G. Beach
Assistant Secretary

CEC UK2 Holding Corporation

By: _____ Date: March 5, 2009
Richard G. Beach
Assistant Secretary

Duke Energy Corporate Services, Inc.

By: _____ Date: March 5, 2009
Richard G. Beach
Assistant Secretary

Equinox Vermont Corporation

By: _____ Date: March 5, 2009
Richard G. Beach
Assistant Secretary

Progress Energy EnviroTree, Inc.

By: _____ **Date:** 4-3-13
Nancy M. Wright
Assistant Secretary

Progress Fuels Corporation

By: _____ **Date:** 4-3-13
Nancy M. Wright
Assistant Secretary

Duke Energy Kentucky
Case No. 2019-00271
Attorney General's First Set Data Requests
Date Received: October 14, 2019

AG-DR-01-063

REQUEST:

Refer to the electronic workpapers provided in response to Staff 1-54 and further to Schedule B-5 and the related tab WPB-5's. Provide a schedule in the same format as the various workpapers with the actual inventory and prepaid amounts for each month January 2018 through the most recent month for which actual information is available for all working capital balances.

RESPONSE:

Please see AG-DR-01-063 Attachment.

PERSON RESPONSIBLE: Danielle Weatherston

DUKE ENERGY KENTUCKY, INC.
ELECTRIC DEPARTMENT
CASE NO. 2019-00271
NATURAL GAS STORAGE BALANCE (ACCT NOS. 164100 & 174273)
FOR THE PERIOD JANUARY 2018 THROUGH SEPTEMBER 2019

LINE NO.	MONTH	AMOUNT (A) $
1	January 2018	2,046,089
2	February	1,490,689
3	March	970,442
4	April	995,417
5	May	1,802,411
6	June	2,359,766
7	July	2,619,274
8	August	3,142,153
9	September	3,499,203
10	October	3,156,706
11	November	2,159,576
12	December 2018	2,239,894
13	January 2019	1,753,312
14	February	1,211,442
15	March	601,283
16	April	1,084,838
17	May	1,793,534
18	June	1,841,540
19	July	2,271,116
20	August	2,709,390
21	September 2019	2,950,256

DUKE ENERGY KENTUCKY, INC.
ELECTRIC DEPARTMENT
CASE NO. 2019-00271
MATERIAL & SUPPLIES
FOR THE PERIOD JANUARY 2018 THROUGH SEPTEMBER 2019

LINE NO.	MONTH	ACCOUNT 154100 - Gas	ACCOUNT 154100 - Elec	ACCOUNT 154200 - Elec	ACCOUNT 154990 - Elec	ACCOUNT 163110 - Gas	ACCOUNT 163110 - Elec
		$	$	$	$	$	$
1	January 2018	300,099	16,582,501	935,946	(30,000)	94,429	615,122
2	February	345,143	16,722,229	830,099	(30,000)	67,056	643,608
3	March	313,445	17,000,536	779,737	(30,000)	73,596	459,596
4	April	293,390	16,549,028	779,737	(30,000)	88,826	396,250
5	May	277,986	16,337,472	779,737	(30,000)	31,082	132,053
6	June	306,547	16,238,594	960,506	(30,000)	146,646	456,858
7	July	314,855	16,312,250	798,465	(30,000)	205,240	649,304
8	August	280,139	16,376,040	799,036	(30,000)	251,009	847,265
9	September	265,108	16,438,816	1,087,572	(43,260)	276,210	1,035,411
10	October	243,101	16,134,441	1,064,310	(46,873)	323,502	1,074,721
11	November	268,800	16,234,515	952,634	(46,873)	360,675	1,142,455
12	December 2018	274,915	16,291,666	940,174	(30,000)	430,765	1,557,409
13	January 2019	313,052	16,267,609	1,018,091	(30,000)	448,968	1,734,106
14	February	273,080	15,817,611	1,082,470	(30,000)	461,767	1,679,806
15	March	271,884	16,132,143	1,392,493	(30,000)	517,553	1,599,490
16	April	224,960	16,042,009	1,800,937	(30,000)	566,735	1,221,233
17	May	250,583	16,238,351	1,554,904	(30,000)	571,902	1,004,875
18	June	221,084	16,331,482	1,666,339	(30,000)	567,568	1,207,115
19	July	207,146	16,265,763	1,552,300	(30,000)	568,016	1,201,163
20	August	214,380	16,242,300	1,810,724	(30,000)	517,404	835,927
21	September 2019	220,823	16,242,979	1,522,181	(30,000)	476,704	741,077

DUKE ENERGY KENTUCKY, INC.
ELECTRIC DEPARTMENT
CASE NO. 2019-00271
PREPAYMENTS
FOR THE PERIOD JANUARY 2018 THROUGH SEPTEMBER 2019

LINE NO.	MONTH	Prepaid Insurance - Elec 165075 (A)	Prepaid Insurance - Gas 165075 (A)	Public Utility Fees - Gas 165400 (A)	Public Utility Fees - Elec 165400 (A)	Collateral Asset Elec 165520 (A)
		$	$	$	$	$
1	January 2018	450,083	59,308	77,353	304,229	206,871
2	February	409,167	53,917	61,883	246,383	2,531,614
3	March	368,250	48,525	46,412	188,537	3,593,634
4	April	327,333	43,133	30,941	130,692	2,667,481
5	May	286,417	37,742	15,471	72,846	1,039,005
6	June	245,500	32,350	188,328	684,816	85,892
7	July	204,583	26,958	172,634	628,998	(20,638)
8	August	163,667	21,567	156,940	576,535	(20,751)
9	September	122,750	16,175	141,246	520,717	(32,707)
10	October	81,833	10,783	125,552	464,898	(33,289)
11	November	40,917	5,392	109,858	412,606	(43,929)
12	December 2018	0	0	94,164	584,788	(44,086)
13	January 2019	410,848	84,027	78,470	499,015	(44,086)
14	February	373,498	76,388	62,776	387,917	(20,304)
15	March	336,149	68,749	47,082	291,819	(44,149)
16	April	298,799	61,111	31,388	195,721	(22,060)
17	May	261,449	53,472	15,694	99,623	(7,365)
18	June	224,099	45,833	199,505	685,624	(7,466)
19	July	186,749	38,194	182,880	628,782	(43,668)
20	August	149,399	30,555	166,254	571,941	(43,771)
21	September 2019	112,049	22,916	149,629	515,099	(43,771)

DUKE ENERGY KENTUCKY, INC.
ELECTRIC DEPARTMENT
CASE NO. 2019-00271
FUEL
FOR THE PERIOD JANUARY 2018 THROUGH SEPTEMBER 2019

LINE NO.	MONTH	Coal Stocks 151130 (A)	Coal Stocks 151131 (A)	Diesel Fuel 151140 (A)	Natural Gas Woodsdale 151660 (A)	Propane Woodsdale 151700 (A)
		$	$	$	$	$
1	January 2018	12,660,986	2,795,991	500,788	0	717,397
2	February	12,109,455	145,780	536,208	0	717,397
3	March	12,609,563	75	417,661	0	581,094
4	April	10,795,018	335,127	417,661	0	507,820
5	May	10,942,376	2,741,998	727,368	0	480,388
6	June	12,316,464	3,161,955	495,919	0	480,388
7	July	11,195,734	3,826,814	608,639	0	480,388
8	August	10,817,095	5,503,595	621,991	0	480,388
9	September	12,051,890	2,261,016	520,217	0	480,388
10	October	12,074,867	2,521,768	793,031	0	480,388
11	November	11,938,913	4,514,562	665,361	0	(0)
12	December 2018	10,905,448	3,450,072	732,718	0	22,387
13	January 2019	9,902,123	2,803,037	643,730	0	0
14	February	8,605,226	3,907,311	1,822,057	0	0
15	March	8,479,526	3,989,848	3,950,995	0	0
16	April	10,658,657	2,686,430	5,595,949	0	0
17	May	11,504,263	4,070,123	5,187,089	0	0
18	June	11,732,554	5,261,458	4,704,443	0	0
19	July	11,275,127	3,293,011	4,789,162	0	0
20	August	9,644,942	3,181,760	5,188,736	0	0
21	September 2019	9,427,454	2,438,804	6,409,686	0	0

AG-DR-01-064

REQUEST:

Provide all work papers and supporting documentation used and relied upon by Dr. Morin in the preparation of his Direct Testimony and exhibits. Provide all spreadsheets in Excel format with cell formulas intact.

RESPONSE:

See response to STAFF-DR-02-093 for electronic copies of exhibits. See also AG-DR-01-064 Attachments 1 and 2.

Dr. Morin's books, Utilities' Cost of Capital and The New Regulatory Finance, are commercially available from Public Utility Reports Inc. and the book/chapters cannot be photocopied or scanned without violating copyright laws.

The bond yields were obtained from Duff & Phelps' (formerly Morningstar, formerly Ibbotson Associates) "Valuation Yearbook" of historical returns, Table B-6 "Long-Term Government Bond Yields". This widely used reference is available by paid commercial subscription only from Duff & Phelps and cannot be disseminated without violating copyright laws, and can be made available for inspection upon reasonable prior notice at the Company's premises.

The Value Line reports for each company in Dr. Morin's peer group are attached as AG-DR-01-064 Attachment 3.

The analyst growth rates in the DCF exhibits were obtained directly on-line from the Yahoo Finance Web site.

With reference to the Allowed ROE Risk Premium Analysis in Dr. Morin's testimony, the annual allowed ROE data was taken from Regulatory Research Associates, Inc.'s (now S&P Global Intelligence) comprehensive quarterly survey of ROE decisions by regulators over the period 1998-2019 for electric and gas utilities ("*Regulatory Focus*", Major Rate Case Decisions). This proprietary data cannot be disseminated electronically due to copyright restrictions that are strictly enforced.

PERSON RESPONSIBLE: Dr. Roger Morin, Ph.D.

MACROECONOMIC ADVISERS
By IHS Markit

Chris Varvares
varvares@macroadvisers.com

Joel Prakken
prakken@macroadvisers.com

Macro Focus

March 29, 2018

How might the expansion end? Boom and Bust is a real risk

It is an unfortunate reality that economic expansions eventually end. Historically, how long they continue and how they end has varied considerably. The current expansion is getting long in the tooth at 8 years 7 months, and the economy, while not without pockets of lingering weakness, has returned essentially to full employment. This is both a blessing and a curse. While there are not obvious significant imbalances whose correction might initiate a process that would end in a downturn, there remain concerns that the seeds of the next recession have already been sown. In this report we a) briefly review the set of factors that typically spell the end of an expansion, b) discuss two possible ways in which the current expansion might end, and c) present an alternative simulation that, given the recent significant reduction in taxes and legislated increase in spending, coming at a time when the economy is already at full employment, illustrates an expansion-ending scenario that should be of increasing concern, which we refer to as the "Boom/Bust" scenario.

So how do expansions typically end?

A review of business cycles reveals that one or more of a small set of key factors or events have typically combined to tip the economy from expansion into recession, sometimes violently. We group these factors into five relatively broad categories: 1) bubbles build and burst; 2) supply/commodity price shocks; 3) policy "mistakes"; 4) financial minefields or meltdowns; and finally, 5) war and pestilence. Let's briefly consider each of these in turn.

Bubbles build and burst:

Perhaps the cause of expansions ending most front of mind is that asset-market bubbles can arise and expand in magnitude sufficiently that their eventual rapid deflation becomes a significant adverse event for the economy that results in a recession. Recent examples include the bursting of the dot-com bubble being a major contributor to the 2001 recession, and of course, the bursting of the housing bubble being a major cause of the Great Recession.

Supply/commodity price shocks:

A sharp increase in the relative price of a key industrial commodity, whether engineered by a cartel, the result of a man-made or natural disaster, or other cause, can have a dramatic impact on both aggregate supply and aggregate demand, resulting in an expansion coming to an end. Two recent and clear examples include the oil price shocks that occurred in the mid- and late 1970s. From mid-1973 to early 1974, oil prices tripled as a result of the formation of the OPEC oil cartel and the resulting effective control of the supply and price of oil. The 1974–1975 recession ensued. Similarly, from late 1978 to early 1980, oil prices increased by more than 2½ times. While in both cases, these were significant relative price shocks, the importance of oil in the US economy was such that the resulting surge in the overall price level resulted in a significant decline in real incomes (and wealth) sufficient to push the economy into recession. (Note that the Fed initially tried to accommodate the price shocks by allowing inflation to rise, rather than resist a rise in the overall price level.) More recently, oil prices roughly doubled, from around $65 per barrel in early 2007 to over $130 per barrel by mid-2008. While the collapse of the housing bubble

and associated collapse in the value of mortgage-backed securities may have been the more important catalyst for the Great Recession, the surge in oil prices also played a significant role.

Policy "mistakes":

Perhaps the most interesting contributing cause of expansions ending are policy mistakes. We put mistakes in quotes because the motivation for policies that may ex post appear to have contributed to a recession can be quite complicated, involving competing interests, bad luck, and the interplay of multiple factors. As an example, the 1953–1954 recession largely resulted from the sharp decline in real defense expenditures at the conclusion of the Korean war. In real terms, those expenditures fell 22% from mid-1953 to mid-1955, with much of that decline subtracting 2.6 percentage points from GDP growth over the four quarters of 1954. The peak-to-trough decline in GDP during the recession was only 2.4%. Reducing defense spending at that time was hardly a "mistake", but it does appear to be the proximate cause of that recession. Ill-timed tax increases that occurred in the late 1960s and in 1990, arguably contributed to recessions that began in 1970 and 1990, respectively. Policymakers at the time felt that such tax increases were necessary to address growing structural federal deficits, but the timing turned out not to be so good from a macroeconomic stability perspective.

Turning to monetary policy, some have argued that the Federal Reserve was late in tightening policy sufficiently in the late 1990s, allowing the dot-com bubble to build and eventually bust, contributing to the 2001 recession. Similarly, the housing bubble that emerged over roughly 2003–2007, along with the more insidious subprime mortgage crisis, arguably could have been averted or mitigated by a more timely Fed policy response aimed at slowing the economy and preventing the bubble in home prices and associated overbuilding. If there was a mistake, it was that policy tightening was too late, followed by a need to tighten more aggressively at the same time the subprime minefield posed a unique and hidden vulnerability. And then there is the significant monetary tightening that occurred beginning in late 1979 aimed at curbing the inflation spiral then underway. The sharp rise in real interest rates played a major role in causing the 1980 and 1981–1982 recessions. Was the tightening or the severity of the tightening a mistake? Few economists would today call it a mistake. In retrospect the policy was effective in ending and reversing the upward inflation spiral then underway, and the move is generally lauded as ushering in the period of low stable inflation we have enjoyed the last couple of decades. If there was a mistake, it was in not responding appropriately to the prior oil-price shock and letting inflation continue to build over the second half of the 1970s. Of course, hindsight is 20/20, and the accuracy of the forecasts upon which policy must in part rely is woefully inadequate to the task...yes, we forecasters share some of the blame.

Financial minefields and meltdowns:

The subprime mortgage debacle is the best example of a financial minefield. These are in the nature of a major mispricing of asset valuations, perhaps the result of a mispricing of risk tied to fraud, "soft fraud" as was identified in the subprime crisis, and the kinds of financial exuberance that economist Hyman Minsky once labelled Ponzi finance. In these cycles, credit and leverage grow rapidly, where accelerating cash flows and rising value of collateral support a (sometimes self-reinforcing) expansion of leverage up until it becomes clear the collateral may not be worth what was previously thought and cashflows are found to be insufficient to prevent default on the loans. At the risk of oversimplification, the subprime crisis occurred as a result of improperly aligned incentives that allowed a mortgage credit boom that fed the house-price bubble, that in turn seemed to justify the credit boom, until it became clear that the price expansion was unsustainable. At the core was a rapid buildup in the issuance of mortgages of questionable quality, and certainly mispriced, that were then wrapped into mortgage-backed securities (MBS) in a rapidly growing securitization binge, while rating agencies failed to see or properly warn of the underlying riskiness of the mortgages. Once the façade began to crack—the Minsky Moment as it has come to be called—MBS values plunged, and a whole super structure of leverage built upon them came crashing down. Homebuilding, which had already

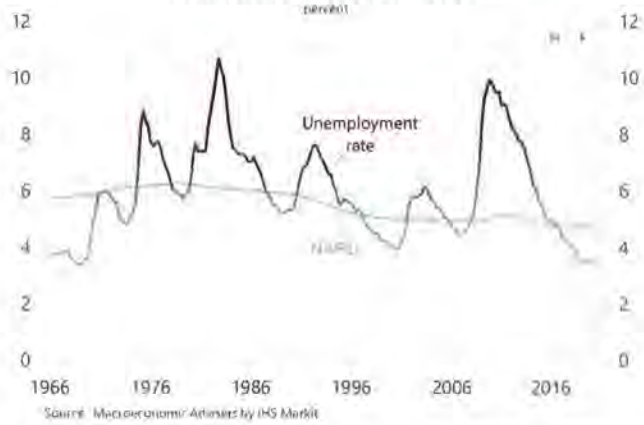
begun to slow as a result of prior overbuilding, then came crashing down, and, well, you know the rest.

War and Pestilence:
This broad category could include any conflict, outbreak of disease, or natural disaster that so disrupts economic activity as to materially reduce output and/or raise unemployment. It could include the 9/11 attacks on the US, which did contribute to the 2001 recession. It's possible that absent the attacks, the weakness evident in 2001 would not have been broad, deep or of sufficient duration to qualify as a recession. The tsunami that hit Japan in March 2011 is also in this category. The tsunami contributed to a sharp 6% annualized decline in Japan's GDP in the first quarter of 2011, followed by a 2% annualized decline in the second quarter. The economy had already declined in the fourth quarter of 2010 at a 2.9% clip, so the tsunami contributed to a three-quarter recession that included a 2.7% cumulative decline in GDP.

In most post-WWII recessions, more than one factor contributed to the downturn, and policy—it could be argued—nearly always played some sort of a role. Often policy's role was in the form of doing too little to prevent the economy from overshooting full-employment. Then, as inflation or asset bubbles built, policy tightening turned out to be sufficiently severe to tip the economy into recession, perhaps with a bursting bubble as part of the mix. This brings us to today and concerns that having essentially reached full employment, if not having overshot it, and with more fiscal stimulus poised to further tighten labor and product markets, tightening monetary policy "just right" will prove to be a difficult, if not impossible task. We often have noted the difficulty of achieving what we call a "soft landing from below," whereby the Federal Reserve is able to slow economic growth by just enough to have the unemployment rate drift up from below the sustainable rate of unemployment (or NAIRU) to the NAIRU. Indeed, such a feat has not been successfully achieved in the US in at least the last half-century.

As seen in the upper-right chart, in each case where the unemployment rate fell below the NAIRU, the economy eventually found itself in a recession. The simple reality is it is quite difficult to apply just the

Chart 1. In search of a Unicorn



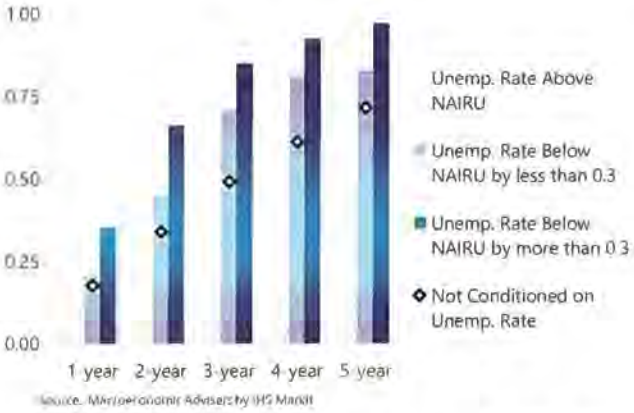
Source: Macroeconomic Advisers by IHS Markit

right amount of policy restraint—fiscal and monetary—to slow the economy enough to see the unemployment rate rise without causing an outright recession. Today, with the unemployment rate at 4.1% and expected to decline to close to 3½% as a result of strong momentum in the economy and fiscal stimulus coming from both the tax cut and the Bipartisan Budget Act of 2018 (BBA 2018), policymakers face a significant challenge in the years ahead to avoid an unacceptably large increase in inflation, while nudging the unemployment rate back toward the sustainable rate of unemployment, estimated to be in the neighborhood of 4½%.

In a recent report, we observed how the ex post probability of a recession occurring over the next 1 to 5 years, in the historical record since the mid-1940s, depended upon whether the unemployment rate was above or below the NAIRU.[1] We found that, if the unemployment rate was below the NAIRU by more than three-tenths of a percentage point, the likelihood of recession two years out was dramatically higher than when the unemployment rate was above the NAIRU. The key findings are summarized in the chart on the next page. The diamonds show the unconditional probability of a recession occurring within the time frame specified on the horizontal axis based on all non-recession months from 1947 to 2016. However, when we conditioned the results based on the unemployment rate relative to the NAIRU, we get dramati-

[1] See our *Recently Asked Questions* report, "What is the probability that a recession will begin at some point over the next year? Or five years?," January 13, 2017.

Chart 2. Recession Probabilities by Maturity of Expansion



Source: Macroeconomic Advisers by IHS Markit

cally different results. As shown in the chart, if the unemployment rate is above the NAIRU, the ex post probability of a recession over the next one through five years rises slowly from below 5% to 50%. However, if the unemployment rate is below the NAIRU the ex post probability rises more quickly, and especially if the unemployment rate is below the NAIRU by more than three-tenths of a percentage point.

The ex post probability of recession tends to rise as the unemployment falls below the NAIRU because as the unemployment rate falls below the estimate of the NAIRU, it indicates a degree of labor market and product market tightness that tends to cause inflation to rise. As the Fed tightened policy to squelch such an increase in inflation, the resulting slowing in economic growth, perhaps intensified by the bursting of an asset bubble, has contributed to an ensuing recession. As noted above, tax surcharges in the late 1960s, aimed at reducing the budget deficit and slowing the rise in inflation, also played a role in the 1970 recession.

Today, with an estimate of the NAIRU near 4½% and an unemployment rate of just 4.1%, this analysis suggests that the probability of recession within the next three years could be elevated, well over 50%. However, there are several reasons why this time could be different. First, the NAIRU could be well below 4½%. Second, we are starting with inflation at least somewhat below the Federal Reserve's inflation target, rather than at 3% or above as occurred late in the prior expansions, meaning that policy tightening could proceed more cautiously than in prior cycles. Third, the short-term relationship between the change in inflation and the level of the unemployment rate relative to NAIRU, what is referred to as the slope of the short-run Phillips curve, has flattened over time. This also argues that the Federal Reserve may be able to tighten policy at a slower pace than was the case in prior cycles.

Another very important reason why this time could be different is that with considerable fiscal stimulus coming online from both the Tax Cuts and Jobs Act of 2017 (TCJA) and the BBA 2018 supporting aggregate demand growth, the probability of recession in the next two years is quite low. Nevertheless, with the effects of fiscal stimulus on growth likely to begin to wane in 2020, at the same time that the Fed is proceeding with a series of interest rate hikes, the likelihood of recession at that time must be thought to be somewhat elevated. Indeed, we view this as the most significant risk to a continuation of the expansion and will be featuring some variant of this scenario as the most likely alternative to our base forecast.

So how will this expansion end?

As the previous discussion suggests, we are concerned that it will be very difficult to achieve the "soft landing from below" and that policy tightening (both explicit monetary tightening from the Fed and implicit fiscal policy tightening when the current bout of stimulus runs its course) will play a role in tipping the economy into a recession. Broadly speaking there are two qualitative scenarios of concern. First, we expect the Fed to raise the federal funds rate target range four times this year. This is somewhat ahead of market expectations (although they are catching up) and so jumps in market interest rates are quite possible as expectations adjust. If such jumps occur, and if the boost to growth from the tax cut and spending increases proves to be not very large, then a sharp slowing in growth cumulating in a recession could occur.

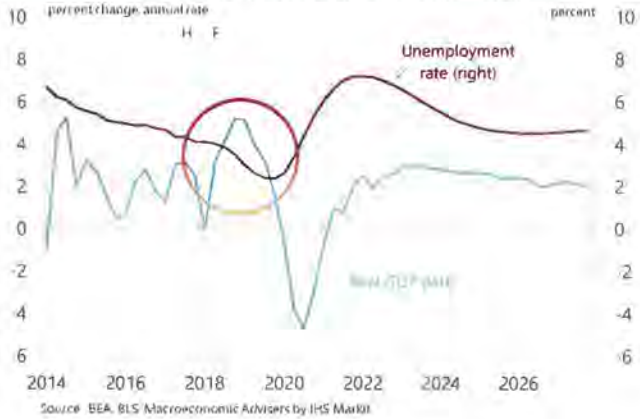
The more likely scenario is what we have termed the "Boom/Bust" scenario. In this case, the Federal Reserve has already set about on a course of interest rate increases it believes is necessary to normalize monetary policy and achieve outcomes for inflation and unemployment consistent with its dual mandate. Projections of economic growth by the Fed and others have been

raised to account for the expected stimulus from the recently legislated tax cut and spending increases. It is quite possible that growth could turn out to be significantly stronger than currently expected, especially if improved business confidence contributes to a dose of positive "animal spirits" resulting in more investment and hiring than is currently expected. That is, the makings of an economic boom are in place. In the Boom/Bust scenario presented below, we assume such a boom occurs with growth of GDP and employment sufficient to push the unemployment rate to below 2½% by mid-2019. GDP growth late in 2018 and early 2019 exceeds 5% (annualized), before later slowing as the effects of the stimulus wane and as rising rates and falling equity values take their toll. An unemployment rate of 2.4% would be the lowest in the US since during the Korean War.

In this scenario inflation begins to rise faster than in the base forecast, and we further assume a little bad luck on inflation, so that core consumer price inflation quickly rises above 2½%, touching 2.9% by early 2019. While we believe the Fed would welcome some temporary overshoot of its 2% inflation target, in this scenario inflation quickly exceeds the Fed's comfort zone. See chart 4.

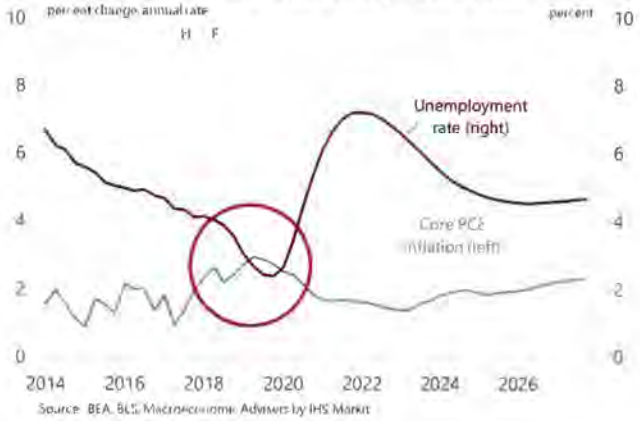
With inflation then well above the Federal Reserve's 2% target and growth of GDP exceeding 5%, the Federal Reserve begins to tighten much more aggressively than in our base projection, and long-term interest rates surge. The top of the target range for the federal funds rate reaches 5½% by late 2019, briefly exceeding both the 2-year and 10-year Treasury Note yields. The surge in rates, along with the widening expectation that the surge in rates will push the economy into a recession is assumed to knock roughly 25% off the value of the S&P 500. This, of course, contributes to the eventual downturn. Home prices also soften, contributing to a significant decline in household net worth that results in a decline in consumer spending. Business fixed investment makes a hasty retreat. The sharp rise in interest rates in the US relative to abroad results in the broad, trade-weighted dollar exchange rate moving roughly 6½% above that in the base projection. The rise in the exchange rate reduces exports and boosts imports, contributing to a lower path of net ex-

Chart 3. Risk of overheating - Boom/Bust



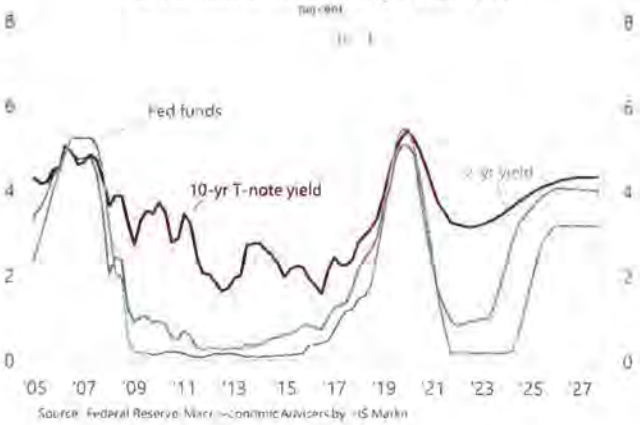
Source: BEA, BLS, Macroeconomic Advisers by IHS Markit

Chart 4. Risk of overheating - Boom/Bust



Source: BEA, BLS, Macroeconomic Advisers by IHS Markit

Chart 5. Risk of overheating - Boom/Bust



Source: Federal Reserve, Macroeconomic Advisers by IHS Markit

ports and weaker GDP. The broad-based decline in aggregate demand reduces employment sufficiently to push the unemployment rate to 7.2%.

Once equity values begin to fall sharply and the economy tips over into recession, the Federal Reserve quickly reverses course and lowers the target range for the federal funds rate all the way back to 0-0.25%. Long-term yields also fall dramatically and the yield curve steepens. The sharp rise and subsequent fall in interest rates is shown in chart 5.

We view this Boom/Bust scenario as a highly plausible way for the current expansion to end. On top of an economy that was already near or beyond full employment and growing above trend, we will soon see the effects of the boost to growth from the tax cut and spending increases recently enacted. A significant upshift in growth, beyond what we have incorporated into our base forecast, is possible. A decline in the unemployment rate below 2½% would surely risk a sharper rise in inflation than is evident in our base projection. The Federal Reserve is already moving to normalize policy, with our base forecast expecting four quarter-point rate hikes this year. Sharply higher GDP growth and inflation and a significantly lower unemployment rate would move the Fed to tighten policy more aggressively. Given the currently somewhat rich valuations of equities, a sharp break in equity values in the face of sharply rising interest rates and a slowing economy is quite plausible. So we view the makings of both a boom and potential bust as already in place. Whether this scenario can be avoided will depend on considerable luck and the adept adjustment of monetary policy. The table below shows some additional details of this Boom/Bust scenario.

																	Q4 / Q4 % change or level at Q4					
	2018.1	2018.2	2018.3	2018.4	2019.1	2019.2	2019.3	2019.4	2020.1	2020.2	2020.3	2020.4	2021.1	2021.2	2021.3	2021.4	2018	2019	2020	2021	2022	2023	2024
Real GDP*																							
Base Solution	1.8	3.2	3.3	3.3	3.1	2.7	2.5	2.3	2.1	2.1	1.9	1.9	1.8	1.8	1.6	1.8	2.9	2.7	2.0	1.7	1.7	1.6	1.6
Boom/Bust scenario	2.1	3.2	4.1	5.2	5.1	4.0	3.2	1.8	-0.7	-3.8	-4.7	-3.0	-0.6	1.0	0.8	2.0	3.7	3.5	-3.1	0.8	2.4	2.9	2.7
Difference	0.3	0.0	0.9	1.9	2.0	1.2	0.7	-0.7	-2.8	-6.0	-6.8	-4.9	-2.4	-0.8	-0.8	0.2	0.8	0.8	-5.1	-1.0	0.7	1.3	1.1
Unemployment Rate**																							
Base Solution	4.1	4.0	3.9	3.7	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.6	3.7	3.5	3.5	3.6	3.8	4.1	4.4
Boom/Bust scenario	4.1	4.0	3.8	3.5	3.0	2.6	2.4	2.4	2.6	3.4	4.4	5.3	6.1	6.6	7.0	7.2	3.5	2.4	5.3	7.2	6.8	5.7	4.8
Difference	0.0	0.0	0.0	-0.2	-0.5	-0.8	-1.1	-1.2	-0.9	-0.1	0.9	1.8	2.6	3.1	3.5	3.6	-0.2	-1.2	1.8	3.6	3.0	1.6	0.5
Core PCE Inflation*																							
Base Solution	2.3	1.9	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.4	2.3	2.3	2.4	2.4	2.4	1.9	2.0	2.3	2.4	2.3	2.2	2.1
Boom/Bust scenario	1.8	2.0	2.2	2.4	2.7	2.9	2.8	2.7	2.5	2.4	2.1	1.8	1.7	1.6	1.7	1.5	2.1	2.8	2.2	1.6	1.4	1.4	1.9
Difference	-0.4	0.1	0.4	0.6	0.8	0.9	0.8	0.5	0.2	0.0	-0.2	-0.5	-0.7	-0.7	-0.7	-0.8	0.2	0.7	-0.1	-0.8	-0.9	-0.8	-0.3
Federal funds rate**																							
Base Solution	1.44	1.72	1.93	2.20	2.46	2.73	2.93	2.97	3.19	3.24	3.44	3.44	3.45	3.45	3.46	3.46	2.20	2.97	3.44	3.46	3.46	3.21	2.96
Boom/Bust scenario	1.44	1.72	2.00	2.54	3.32	4.32	5.12	5.44	5.44	5.04	4.24	3.36	2.41	1.53	0.80	0.18	2.54	5.44	3.36	0.18	0.18	0.18	1.20
Difference	0.00	-0.20	-0.17	0.33	0.87	1.58	2.19	2.47	2.25	1.80	0.80	-0.08	-1.04	-1.92	-2.66	-3.28	0.33	2.47	-0.08	-3.28	-3.28	-3.03	-1.76
10-year T-note yield**																							
Base Solution	2.78	2.94	3.12	3.27	3.40	3.49	3.55	3.60	3.64	3.68	3.71	3.72	3.72	3.72	3.72	3.71	3.27	3.60	3.72	3.71	3.69	3.67	3.67
Boom/Bust scenario	2.73	2.96	3.11	3.37	3.94	4.41	4.74	4.97	5.10	4.90	4.60	4.20	3.75	3.40	3.20	2.95	3.37	4.97	4.20	2.95	2.86	3.12	3.52
Difference	-0.05	0.02	-0.01	0.09	0.53	0.92	1.18	1.37	1.46	1.22	0.89	0.48	0.03	-0.32	-0.52	-0.77	0.09	1.37	0.48	-0.77	-0.82	-0.55	-0.15
S&P 500 Stock Index**																							
Base Solution	2714	2759	2726	2696	2674	2661	2655	2653	2655	2659	2666	2678	2691	2707	2724	2744	2696	2653	2678	2744	2831	2930	3038
Boom/Bust scenario	2668	2748	2803	2860	2859	2830	2547	2292	2063	1960	2390	2510	2643	2734	2783	2917	2860	2292	2067	2582	2789	2900	2987
% Difference	-1.7	-0.4	2.8	6.1	6.9	6.4	-4.0	-13.6	-22.3	-26.3	-10.4	-6.3	-1.8	1.0	2.1	6.3	6.1	-13.6	-22.8	-5.9	-1.5	-1.0	-1.7
Home Prices (CoreLogic)*																							
Base Solution	5.9	4.8	4.7	4.6	4.2	4.1	4.1	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0	4.0	3.0	3.0	3.0	2.6	1.7
Boom/Bust scenario	5.1	4.0	3.7	3.7	2.0	1.0	-4.0	-5.0	-1.0	-1.8	-1.1	-0.9	-0.3	0.4	1.0	1.6	4.1	-1.5	-1.2	0.6	2.4	2.8	3.1
Difference	-0.8	-0.8	-1.0	-1.0	-2.2	-3.1	-8.1	-8.5	-4.0	-4.9	-4.0	-3.9	-3.3	-2.6	-2.0	-1.4	-0.9	-5.5	-4.2	-2.4	-0.6	0.2	1.4
Broad trade-weighted dollar**																							
Base Solution	117.6	117.8	118.2	118.6	119.1	119.4	119.7	119.7	119.6	119.4	119.3	119.2	119.1	119.0	118.9	118.8	118.6	119.7	119.2	118.8	118.0	117.6	118.3
Boom/Bust scenario	117.0	118.4	120.1	121.7	123.5	125.5	127.3	127.5	127.4	126.9	126.3	125.7	124.8	123.5	122.0	120.2	121.7	127.5	125.7	120.2	117.1	114.9	114.8
% Difference	-0.5	0.5	1.6	2.6	3.7	5.1	6.3	6.6	6.5	6.2	5.9	5.5	4.8	3.8	2.5	1.2	2.5	6.6	5.5	1.2	-0.8	-2.5	-3.0

* Q4 to Q4 percent change
** Q4 average

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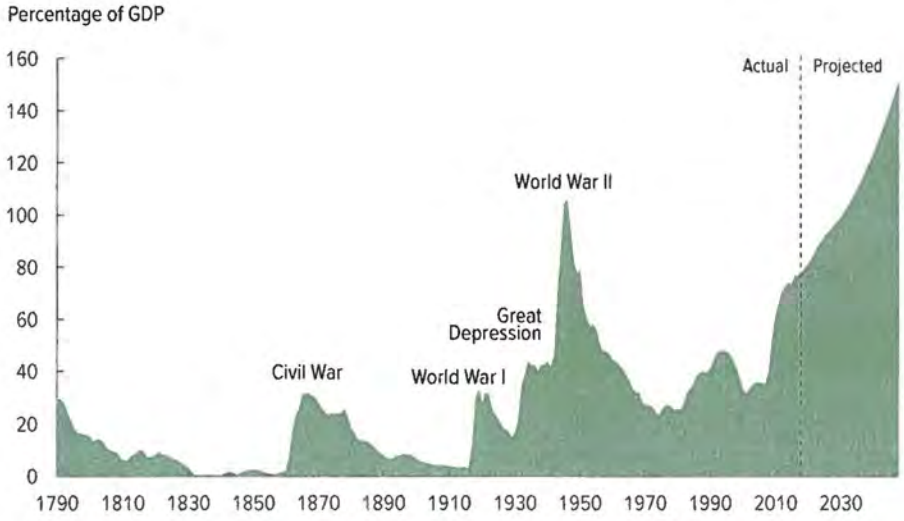
CONGRESS OF THE UNITED STATES
CONGRESSIONAL BUDGET OFFICE

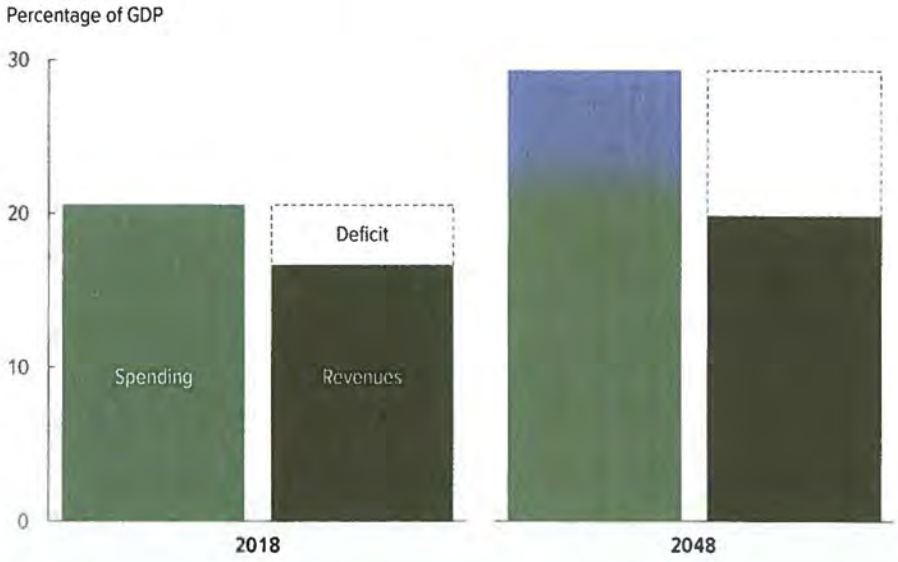
CBO

The 2018 Long-Term Budget Outlook



Under current law, federal debt held by the public is projected to increase sharply over the next 30 years...

...as spending grows more quickly than revenues do. Driving that spending growth are interest payments on the debt, major health care programs, and Social Security.



JUNE 2018

At a Glance

Each year, the Congressional Budget Office issues a set of long-term budget projections—that is, projections of what federal spending, revenues, deficits, and debt would be for the next 30 years if current laws generally did not change. This report is the latest in the series.

- In CBO's projections, the federal budget **deficit**, relative to the size of the economy, grows substantially over the next several years, stabilizes for a few years, and then grows again over the rest of the 30-year period, leading to federal **debt** held by the public that would approach 100 percent of gross domestic product (GDP) by the end of the next decade and 152 percent by 2048. Moreover, if lawmakers changed current laws to maintain certain policies now in place—preventing a significant increase in individual income taxes in 2026, for example—the result would be even larger increases in debt.

- The federal government's **net interest costs** are projected to climb sharply as interest rates rise from their currently low levels and as debt accumulates. Such spending would about equal spending for Social Security, currently the largest federal program, by the end of the projection period.

- **Noninterest spending** is projected to rise from 19 percent of GDP in 2018 to 23 percent in 2048, mainly because of increases in spending for Social Security and the major health care programs (primarily Medicare). Much of the spending growth for Social Security and Medicare results from the aging of the population. Growth in spending for Medicare and the other major health care programs is also driven by rising health care costs per person.

- **Revenues,** in contrast, are projected to be roughly flat over the next few years relative to GDP, rise slowly, and then jump in 2026. Thereafter, revenues would continue to rise relative to the size of the economy—although they would not keep pace with growth in spending. The projected growth in revenues is largely attributable to increases in individual income tax receipts.

- **Compared with last year's projections,** debt as a percentage of GDP is larger, but only modestly so, through 2041 and then lower thereafter. Deficits are higher as a percentage of GDP through 2025 and lower thereafter. That change is largely driven by changes in revenues and net interest costs. Revenues are initially lower as a share of GDP, but ultimately are higher because individual income taxes are now projected to grow more quickly as a result of provisions of Public Law 115-97 (originally called the Tax Cuts and Jobs Act and called the 2017 tax act in this report).

Contents

Notes

The Congressional Budget Office's extended baseline shows the budget's long-term path under most of the same assumptions that the agency uses, in accordance with statutory requirements, in constructing its 10-year baseline. Both baselines incorporate the assumptions that current law generally remains unchanged but that some mandatory programs are extended after their authorizations lapse and that spending for Medicare and Social Security continues as scheduled even if their trust funds are exhausted.

Unless this report indicates otherwise, the years that it refers to are federal fiscal years, which run from October 1 to September 30 and are designated by the calendar year in which they end. Budgetary values, such as the ratio of debt or deficits to gross domestic product, are calculated on a fiscal year basis; economic variables, such as gross national product or interest rates, are calculated on a calendar year basis.

Numbers in the text, tables, and figures may not sum to totals because of rounding.

Unless the report specifies otherwise, Medicare outlays are presented net of offsetting receipts, which reduce outlays for the program.

As referred to in this report, the Affordable Care Act comprises the Patient Protection and Affordable Care Act; the health care provisions of the Health Care and Education Reconciliation Act of 2010; and the effects of subsequent judicial decisions, statutory changes, and administrative actions.

Data and supplemental information files—the data underlying the figures in this report, supplemental budget projections, and the demographic and economic variables underlying those projections—are posted along with the report on CBO's website.

The 2018 Long-Term Budget Outlook

Summary

At 78 percent of gross domestic product (GDP), federal debt held by the public is now at its highest level since shortly after World War II. If current laws generally remained unchanged, the Congressional Budget Office projects, growing budget deficits would boost that debt sharply over the next 30 years; it would approach 100 percent of GDP by the end of the next decade and 152 percent by 2048 (see Table 1). That amount would be the highest in the nation's history by far. Moreover, if lawmakers changed current law to maintain certain policies now in place—preventing a significant increase in individual income taxes in 2026, for example—the result would be even larger increases in debt.[1] The prospect of large and growing debt poses substantial risks for the nation and presents policymakers with significant challenges.

In this report, CBO presents its projections of federal spending, revenues, deficits, and debt for the next three decades and describes some possible consequences of those budgetary outcomes. This report's projections are consistent with the 10-year baseline budget and economic projections that CBO published in the spring of 2018.[2] They extend most of the concepts underlying those projections for an additional 20 years, and they reflect the macroeconomic effects of projected fiscal policy over that 30-year period. All together, they constitute the agency's *extended baseline* projections.

CBO's 10-year and extended baseline projections are not predictions of budgetary outcomes. Rather, they represent the agency's best assessment of future spending, revenues, deficits, and debt under the assumption that current laws generally remain unchanged. They also give lawmakers a point of comparison from which to measure the effects of proposed legislation.

Why Are Projected Deficits Rising?

In CBO's projections, the federal budget deficit, relative to the size of the economy, would grow substantially over the next several years, stabilize for a few years, and then grow again over the rest of the 30-year period. In total, deficits would rise from 3.9 percent of GDP in 2018 to 9.5 percent in 2048. (Adjusted to exclude the effects of timing shifts that occur because fiscal year 2018 began on a weekend, the budget deficit in 2018 would be higher, at 4.2 percent of GDP).[3] Those large budget deficits would arise because spending would grow steadily under current law, and revenues would not keep pace with that spending growth (see Figure 1).

In particular, over the next 30 years, spending as a share of GDP would increase for Social Security, the major health care programs (primarily Medicare), and interest on the government's debt. In CBO's projections, most of the spending growth for Social Security and Medicare results from the aging of the population: As members of

1. CBO will analyze the effects of alternative fiscal scenarios in a forthcoming report.

2. CBO bases its long-term projections on its most recent 10-year budget projections. Typically, those projections are from the *Budget and Economic Outlook*; however, CBO made a number of relatively small changes to its baseline projections since the publication of that report in April. As a result, the long-term budget projections in this report are based on CBO's adjusted April 2018 baseline. For information on those underlying budget projections, see Congressional Budget Office, *An Analysis of the President's 2019 Budget* (May 2018), www.cbo.gov/publication/53884. For information on CBO's most recent economic projections, see Congressional Budget Office, *The Budget and Economic Outlook: 2018 to 2028* (April 2018), www.cbo.gov/publication/53651.

3. When the first day of the fiscal year (October 1) falls on a weekend, certain monthly payments (mostly for mandatory benefit programs such as Medicare, Supplemental Security Income, and certain programs for veterans) normally made on that day are shifted to the preceding fiscal year. Accordingly, for those benefit programs, only 11 months of payments will be made in that fiscal year rather than the usual 12, and the previous year will have one more payment. October 1 fell on a weekend in 2017, and that will happen again in 2022, 2023, and 2028. The resulting shifts in payments noticeably boost projected spending and deficits in 2022 and 2028; they reduce spending and the deficit in 2018 and 2024.

Table 1.

Key Projections in CBO's Extended Baseline

Percentage of Gross Domestic Product

		Projected Annual Average		
	2018	2019–2028	2029–2038	2039–2048
Revenues				
Individual income taxes	8.2	8.9	10.1	10.7
Payroll taxes	5.9	5.9	6.0	6.0
Corporate income taxes	1.2	1.5	1.4	1.4
Other[a]	1.4	1.2	1.3	1.5
Total Revenues	**16.6**	**17.5**	**18.8**	**19.5**
Outlays				
Mandatory				
Social Security	4.9	5.5	6.2	6.3
Major health care programs[b]	5.2	6.0	7.4	8.7
Other	2.6	2.5	2.3	2.1
Subtotal	12.6	13.9	15.9	17.2
Discretionary	6.3	5.7	5.4	5.5
Net interest	1.6	2.7	3.6	5.3
Total Outlays	**20.6**	**22.4**	**24.9**	**27.9**
Deficit	**-3.9**	**-4.9**	**-6.1**	**-8.4**
Debt Held by the Public at the End of the Period	**78**	**96**	**118**	**152**
Memorandum:				
Social Security				
Revenues[c]	4.4	4.5	4.6	4.5
Outlays[d]	4.9	5.5	6.2	6.3
Contribution to the Federal Deficit[e]	-0.4	-1.0	-1.6	-1.9
Medicare				
Revenues[c]	1.4	1.5	1.6	1.6
Outlays[d]	3.5	4.3	5.7	6.8
Offsetting Receipts	-0.6	-0.8	-1.0	-1.3
Contribution to the Federal Deficit[e]	-1.5	-2.1	-3.0	-3.9
Gross Domestic Product at the End of the Period (Trillions of dollars)	20.1	29.8	44.1	65.0

Source: Congressional Budget Office.

This table satisfies a requirement specified in section 3111 of S. Con. Res. 11, the Concurrent Resolution on the Budget for Fiscal Year 2016.

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections through 2028 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

a. Consists of excise taxes, remittances to the Treasury from the Federal Reserve System, customs duties, estate and gift taxes, and miscellaneous fees and fines.

b. Consists of spending for Medicare (net of premiums and other offsetting receipts), Medicaid, and the Children's Health Insurance Program, as well as outlays to subsidize health insurance purchased through the marketplaces established under the Affordable Care Act and related spending.

c. Includes all payroll taxes for the program other than those paid by the federal government on behalf of its employees (which are intragovernmental transactions). Also includes income taxes paid on Social Security benefits, which are credited to the trust funds. Excludes interest credited to the trust funds.

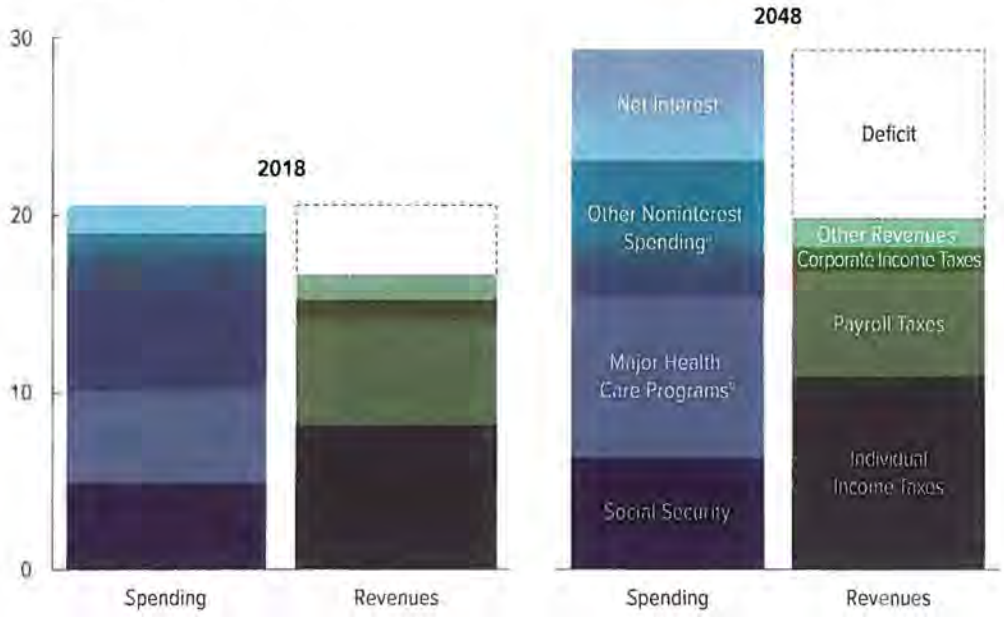
d. Excludes discretionary outlays related to administration of the program.

e. The contribution to the deficit shown here differs from the change in the trust fund balance for the program because it excludes intragovernmental transactions, interest earned on balances, and outlays related to administration of the program.

Figure 1.

The Federal Budget in CBO's Extended Baseline

Percentage of Gross Domestic Product



If current laws generally remained unchanged, the federal budget deficit would grow substantially over the next 30 years. Those large budget deficits would arise because spending would grow steadily and revenues would not keep pace with that spending growth.

Source: Congressional Budget Office.

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections through 2028 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

a. Consists of all federal spending other than that for Social Security, the major health care programs, and net interest.

b. Consists of spending for Medicare (net of premiums and other offsetting receipts), Medicaid, and the Children's Health Insurance Program, as well as outlays to subsidize health insurance purchased through the marketplaces established under the Affordable Care Act and related spending.

c. Consists of excise taxes, remittances to the Treasury from the Federal Reserve System, customs duties, estate and gift taxes, and miscellaneous fees and fines.

the baby-boom generation (people born between 1946 and 1964) age and as life expectancy continues to rise, the percentage of the population age 65 or older will grow sharply, boosting the number of beneficiaries of those programs. Growth in spending on Medicare and the other major health care programs is also driven by rising health care costs per person. In addition, the federal government's net interest costs are projected to climb sharply as a percentage of GDP as interest rates rise from their currently low levels and as debt accumulates.

That spending growth would be only partially offset by declining spending for other programs. Mandatory spending other than that for Social Security and the major health care programs—such as spending for federal employees' pensions and for various income security programs—is projected to decrease as a percentage of GDP. Discretionary spending is projected to decline in most years over the next decade and then roughly stabilize as a percentage of GDP. (Mandatory spending is generally governed by provisions of permanent law, whereas discretionary spending is controlled by annual appropriation acts.)

Revenues, in contrast, would take a different path. They are projected to be roughly flat over the next few years relative to GDP, rise slowly, and then jump in 2026. Revenues would sharply increase that year because most of the provisions of Public Law 115-97 (originally called the Tax Cuts and Jobs Act and called the 2017 tax act in this report) that directly affect the individual income tax rate are set to expire at the end of calendar year 2025. (The 2017 tax act lowered individual income taxes beginning in 2018.) Thereafter, revenues would continue

to rise relative to the size of the economy—although they would not keep pace with spending growth.

The projected growth in revenues beyond 2028 is largely attributable to increases in individual income tax receipts. Those receipts are projected to grow mainly because income would rise more quickly than the price index that is used to adjust tax brackets and other parameters of the tax system. As a result, more income would be pushed into higher tax brackets over time. (Because of provisions of the 2017 tax act, the effect of real bracket creep in this year's projections is slightly greater than the effect that CBO projected in prior years.) Combined receipts from all other sources are projected to increase slightly as a percentage of GDP.

What Might Happen If Current Laws Remained Unchanged?

Large and growing federal debt over the coming decades would hurt the economy and constrain future budget policy. The amount of debt that is projected under the extended baseline would reduce national saving and income in the long term; increase the government's interest costs, putting more pressure on the rest of the budget; limit lawmakers' ability to respond to unforeseen events; and increase the likelihood of a fiscal crisis. (In that event, investors would become unwilling to finance the government's borrowing unless they were compensated with very high interest rates.)

How Does CBO Make Its Long-Term Budget Projections?

CBO's extended baseline, produced once a year, shows the budget's long-term path under most of the same assumptions that the agency uses in constructing its 10-year baseline. Both baselines incorporate these assumptions: current laws will generally remain unchanged, mandatory programs will be extended after their authorizations lapse, and spending for Medicare and Social Security will continue as scheduled even if their trust funds are exhausted. CBO makes those assumptions to conform to statutory requirements.

Some projections, such as those for Social Security spending and collections of individual income taxes, incorporate detailed estimates of how people would be affected by particular elements of programs or by the tax code. Other projections reflect past trends and CBO's assessments of how those trends would evolve if current laws generally remained unchanged.[4]

CBO's budget projections are built on its demographic and economic projections. CBO estimates that the population will grow more slowly than it has in the past and will be older, on average. CBO also anticipates that if current laws generally did not change, real GDP—that is, GDP with the effects of inflation removed—would increase by 1.9 percent per year, on average, over the next 30 years. That rate is nearly 1 percentage point lower than the annual average growth rate of real GDP over the past 50 years. That expectation of slower economic growth in the future is attributable to several factors—most notably, slower growth of the labor force. Projected growth in output is also held down by the effects of changes in fiscal policy under current law—above all, by the reduction in private investment that is projected to result from rising federal deficits.

How Uncertain Are Those Projections?

If current laws governing taxes and spending remained generally the same, debt would rise as a percentage of GDP over the next 30 years, according to CBO's central estimate (the middle of the distribution of potential outcomes). That projection is very uncertain, however, so the agency examined in detail how debt would change if four key factors were higher or lower than their levels in the extended baseline. Those four factors are labor force participation, productivity in the economy, interest rates on federal debt, and health care costs per person. Other factors—such as an economic depression, a major war, or unexpected changes in rates of fertility, immigration, or mortality—also could affect the trajectory of debt. Taking into account a range of uncertainty around CBO's central projections of those four key inputs, CBO concludes that despite the considerable uncertainty of long-term projections, debt as a percentage of GDP would probably be greater—in all likelihood, much greater—than it is today if current laws remained generally unchanged.

How Large Would Changes in Spending or Revenues Need to Be to Reach Certain Goals for Federal Debt?

CBO estimated the size of changes that would be needed to achieve a chosen goal for federal debt. For example, if lawmakers wanted to reduce the amount of debt in 2048 to 41 percent of GDP (its average over the past 50 years), they might cut noninterest spending, increase revenues, or take a combination of both approaches to make changes

4. For more information about how CBO makes long-term projections about the economy and federal budget, see Congressional Budget Office, *An Overview of CBOLT: The Congressional Budget Office Long-Term Model* (April 2018), www.cbo.gov/publication/53667.

that equaled 3.0 percent of GDP each year starting in 2019. (In dollar terms, that amount would total about $630 billion in 2019.) If, instead, policymakers wanted debt in 2048 to equal its current share of GDP (78 percent), the necessary changes would be smaller (although still substantial), totaling 1.9 percent of GDP per year (or about $400 billion in 2019). The longer lawmakers waited to act, the larger the policy changes would need to be to reach any particular goal for federal debt.

How Have CBO's Projections Changed Over the Past Year?

Compared with last year's projections, CBO's current projections of debt as a share of GDP are higher through 2041 and lower thereafter. CBO now projects that debt measured as a share of GDP would be 3 percentage points lower in 2047 than it projected last year. (The previous edition of this volume showed projections through 2047.)[5] The increase in debt through 2041 stems primarily from tax and spending legislation enacted since then that boosted projected deficits through 2025—especially the 2017 tax act, the Bipartisan Budget Act of 2018 (P.L. 115-123), and the Consolidated Appropriations Act, 2018 (P.L. 115-141). In particular, the budgetary effects of the tax act are expected to peak during the middle of the next decade. In later years, the effects are expected to be modest, although their precise magnitudes are uncertain.

Deficits are smaller after 2025 than CBO projected last year because of lower projections as a share of GDP of noninterest spending and because of projections of revenues that are the same or higher than CBO estimated last year. The smaller deficits result in lower debt as a share of GDP after 2041 than CBO projected last year.

The Budget Outlook for the Next 30 Years

CBO's extended baseline shows a substantial imbalance in the federal budget over the next three decades. Growing budget deficits would lead to rising amounts of federal debt, which in turn would increase pressures on the federal budget and dampen economic growth.

Rising Budget Deficits

If current laws generally remained unchanged, the federal budget deficit would grow substantially over the next few years. It would rise to 4.2 percent of GDP this year (up from 3.5 percent last year) and then climb to 5.1 percent by 2022 (adjusted to exclude shifts in timing). The deficit would then continue to rise in dollar terms but stabilize as a percentage of GDP for the rest of the 10-year baseline period—although it would remain much higher than its 50-year average of 2.9 percent. In the following two decades, deficits would become notably larger again relative to the size of the economy as the gap between spending and revenues grew (see Figure 2). As a result, the deficit would rise from 4.8 percent of GDP in 2028 (adjusted to exclude shifts in timing) to 9.5 percent in 2048.

CBO projects that mandatory spending would rise significantly as a percentage of GDP under current law, driving up spending relative to revenues. The aging of the population will lead to increased outlays for Social Security and Medicare, mandatory programs that primarily benefit people 65 or older. Medicare outlays would also climb as a result of rising health care costs per person, in CBO's estimation. By 2048, under current law, federal spending through those two programs as well as Medicaid—the federal health care program for people with limited income and resources—for people age 65 or older would account for about half of all federal noninterest spending, compared with about two-fifths today. Moreover, because federal debt is projected to grow and interest rates are expected to rise from their currently low levels, interest payments on the government's debt would rise sharply.

All told, under CBO's extended baseline, federal spending would increase from today's 21 percent of GDP to 23 percent in 2028 (adjusted to exclude shifts in timing; that spending would be 24 percent if timing shifts were included) and to 29 percent by 2048. (Federal spending has averaged 20 percent of GDP over the past 50 years.)

Meanwhile, if current laws generally remained unchanged, revenues would remain near 16.6 percent of GDP for a few years (their current level), rise steadily to 17.5 percent by 2025, and then increase sharply in 2026 following the scheduled expiration of many provisions of the 2017 tax act.[6] Revenues are projected to increase to 18.1 percent of GDP in that year and then rise to 18.5 percent by 2028. Beyond 2028, revenues would grow faster than the economy but more slowly

5. See Congressional Budget Office, *The 2017 Long-Term Budget Outlook* (March 2017), www.cbo.gov/publication/52480.

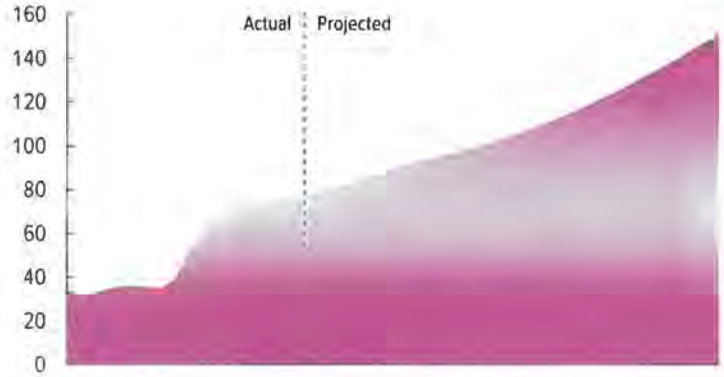
6. That law made many significant changes to the individual and corporate income tax systems. Those changes, on net, lowered taxes owed by most individuals and businesses beginning in calendar year 2018. Nearly all of the changes to individual income taxes are set to expire at the end of calendar year 2025.

Figure 2.

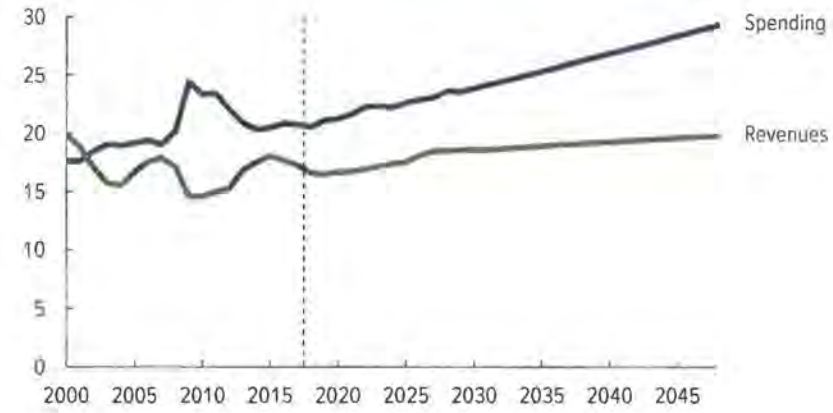
Federal Debt, Spending, and Revenues

Percentage of Gross Domestic Product

In CBO's extended baseline, federal debt held by the public rises...



...because growth in **total spending** outpaces growth in **total revenues**, resulting in larger budget deficits.



Source: Congressional Budget Office.

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections through 2028 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

GDP = gross domestic product.

Continued

than spending. In part, revenues would rise because of real bracket creep, which pushes more income into higher tax brackets as people's income rises faster than inflation. In addition, revenues would grow rapidly from a new excise tax on certain employment-based health insurance plans if that law took effect, as scheduled, in 2022. All told, CBO projects, revenues would reach 19.8 percent of GDP in 2048. Although that share would exceed the 50-year average of about 17 percent, it would still fall short of projected spending.

Greater Accumulation of Federal Debt

Debt held by the public represents the amount that the federal government has borrowed in financial markets by issuing Treasury securities to pay for its operations and activities.[7] Measuring debt as a percentage of GDP is useful for comparing amounts of debt in different

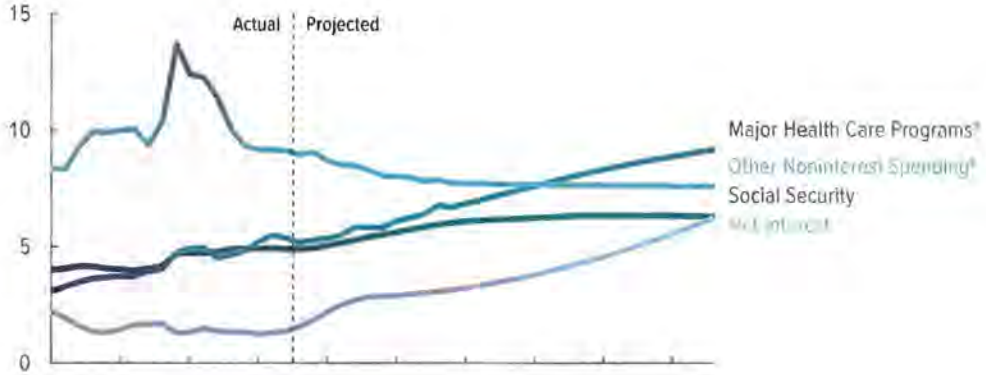
7. When the federal government borrows in financial markets, it competes with other participants for financial resources and, in the long term, crowds out private investment, thus reducing economic output and income. By contrast, federal debt held by trust funds and other government accounts represents internal transactions of the government and does not directly affect financial markets. (Together, that debt and debt held by the public make up gross federal debt.) For more discussion, see Congressional Budget Office, *Federal Debt and Interest Costs* (December 2010), www.cbo.gov/publication/21960. Several factors not directly included in the budget totals also affect the government's need to borrow from the public. They include fluctuations in the government's cash balance, as well as the cash flows of the financing accounts used for federal credit programs.

Figure 2. Continued

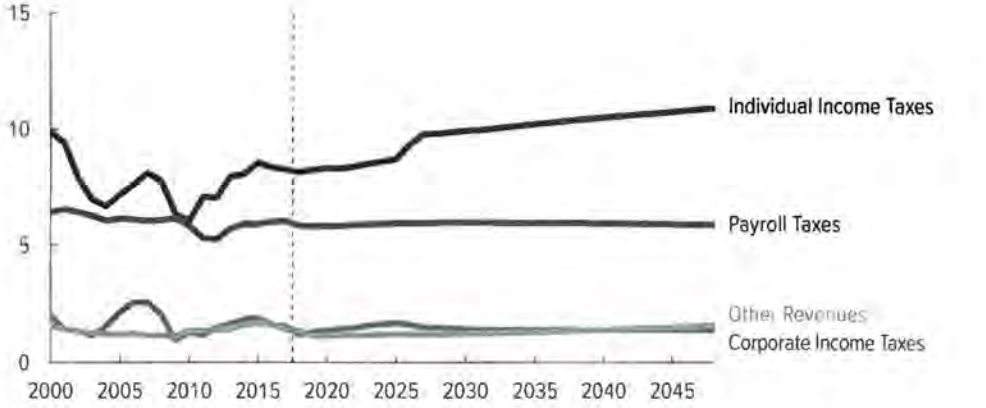
Federal Debt, Spending, and Revenues

Percentage of Gross Domestic Product

Spending on certain components of the budget—Social Security, the major health care programs, and net interest—is projected to rise relative to GDP; other spending, in total, is projected to decline.



Increases in individual income taxes account for most of the rise in total **revenues** relative to GDP. Receipts from all other sources, taken together, are projected to be slightly higher in 2048 than they are today.



a. Consists of spending for Medicare (net of premiums and other offsetting receipts), Medicaid, and the Children's Health Insurance Program, as well as outlays to subsidize health insurance purchased through the marketplaces established under the Affordable Care Act and related spending.

b. Consists of all federal spending other than that for Social Security, the major health care programs, and net interest.

c. Consists of excise taxes, remittances to the Treasury from the Federal Reserve System, customs duties, estate and gift taxes, and miscellaneous fees and fines.

years because it accounts for changes in price levels, population, output, and income—all of which affect the nation's ability to finance the debt. The ratio of debt to GDP places the effects of potential adjustments to the budget within the context of the nation's resources. Examining whether debt as a percentage of GDP is increasing is therefore a simple and meaningful way to assess the budget's sustainability.

Federal debt held by the public has ballooned over the past decade. At the end of 2007, that debt stood at 35 percent of GDP, but deficits arising from the 2007–2009 recession and the resulting policy responses caused it to grow sharply over the next five years. By the end of 2012, debt as a share of GDP had doubled to 70 percent. Since then, the upward trajectory has generally continued, and debt is projected to reach 78 percent of GDP by the end of this year—a very high amount by historical standards. (For comparison, such debt has averaged 41 percent of GDP over the past 50 years.) During only one other period in U.S. history—from 1944 through 1950, because of the surge in federal spending during World War II—has that debt exceeded 70 percent of GDP (see Figure 3).

If current laws generally remained unchanged, the gap between spending and revenues would grow substantially through 2022, stabilize for a few years, and then continue to widen. As a result, federal debt as a percentage of GDP would reach unprecedented levels. CBO projects that debt

Figure 3.

Federal Debt Held by the Public

Percentage of Gross Domestic Product

High and rising federal debt would reduce national saving and income, boost the government's interest payments, limit lawmakers' ability to respond to unforeseen events, and increase the likelihood of a fiscal crisis.

Source: Congressional Budget Office.

would rise to 96 percent of GDP by 2028, and six years later, in 2034, it would surpass the peak of 106 percent recorded in 1946. By 2048, federal debt would reach 152 percent of GDP—significantly larger than the average of the past five decades—and would be on track to grow even larger. Moreover, if lawmakers changed current laws to maintain certain policies now in place—preventing a significant increase in individual income taxes in 2026, for example—the result would be even larger increases in debt.

Consequences of a Large and Growing Federal Debt

The burgeoning federal debt over the coming decades would have these effects:

- Reduce national saving and income in the long term;
- Increase the government's interest costs, putting more pressure on the rest of the budget;
- Limit lawmakers' ability to respond to unforeseen events; and
- Increase the likelihood of a fiscal crisis, a situation in which the interest rate on federal debt rises abruptly, dramatically increasing the cost of government borrowing.

Less National Saving and Lower Income

Large federal budget deficits over the long term would reduce investment, resulting in lower national income and higher interest rates than would otherwise be the case. If the government borrowed more money, a greater amount of household and business saving would be used to buy Treasury securities, thus crowding out private investment. Both the government and private borrowers would face higher interest rates to compete for savings. Although those higher rates would strengthen the incentive to save, the increased government borrowing would exceed the rise in saving by households and businesses. As a result, total saving by all sectors of the economy (national saving) would be lower, as would private investment and economic output. (Private investment would be affected less than national saving because higher interest rates tend to attract more foreign capital to the United States and induce U.S. savers to keep more of their money at home.) With less investment in capital goods—such as factories and computers—workers would be less productive. Because productivity growth is the main driver of growth in people's real compensation, decreased investment also would reduce average compensation per hour, making people less inclined to work. CBO's extended baseline incorporates those economic effects as well as the feedback to the budget from negative effects on the economy.

Greater Pressure on the Budget From Higher Interest Costs

Current net interest costs are relatively small because interest rates have been so low. Under CBO's extended baseline, however, rising interest rates and increased federal borrowing boost net interest costs substantially. By 2045, those costs would surpass discretionary spending for the first time since 1962 (the earliest year for which relevant data are available).

Over the next few years, the unemployment rate is expected to decline and inflation is projected to rise. CBO expects the Federal Reserve to respond to those developments by continuing to raise the federal funds rate to keep inflation close to the central bank's long-term goal.[8] In addition, long-term interest rates are projected to rise gradually relative to short-term rates as the term premium (the premium paid to bondholders for the extra risk associated with holding longer-term bonds) moves up from its recent low levels. The term premium is projected to rise as investors gain more confidence in global economic growth, the demand for long-term Treasury securities as a hedge against unexpected declines in inflation dissipates, and the Federal Reserve reduces its holdings of long-term assets. CBO projects that interest rates would eventually settle at levels consistent with factors such as productivity growth, the demand for investment, and federal deficits. Under the extended baseline, interest costs are much higher than they would be if deficits were smaller and interest rates were lower.

The higher the government's interest costs, the more difficult it would be to achieve any particular target for deficit reduction. That is because, in order to reduce the deficit, tax increases, spending reductions, or both would have to be greater. Such policy changes could affect the economy and people's well-being. If, for example, policy changes included an increase in marginal tax rates (the rates that apply to an additional dollar of income), people's incentives to work and save would diminish as tax rates rose.[9] Alternatively, if policy changes included a reduction in federal spending for investment, both output and income would be lower than they would have been if that spending had not been reduced.[10] In contrast, if reductions in, say, Social Security benefits were made to lessen spending, people might feel compelled to work more to replace that lost income, thus increasing output.

Reduced Ability to Respond to Unforeseen Events

When outstanding debt is relatively small, the federal government is able to borrow money at lower rates to cover unexpected costs, such as those that arise from recessions, financial crises, natural disasters, or wars. By contrast, when outstanding debt is large, the government has less flexibility to address financial and economic crises. A large debt also can compromise a country's national security by constraining military spending in times of international crisis or by limiting the government's ability to prepare for (or respond to) such a crisis.

At the outset of the 2007–2009 recession, when federal debt held by the public was below 40 percent of GDP, lawmakers had the flexibility necessary to respond to the financial crisis. The recession resulted in lower output and income, which caused sharp declines in tax revenues and increases in mandatory spending. The policy responses included increases in federal spending to stabilize the financial sector, boost investment in infrastructure, and add to income security programs, along with temporary decreases in business and payroll taxes. As a result, by 2012, federal debt as a percentage of GDP had doubled from its 2007 level.

If another recession or fiscal crisis occurred and if federal debt was at its current level or higher, the government might have a more difficult time implementing similar costly actions in response. As a result, such events could have larger negative effects on the economy and on people's well-being. Moreover, the reduced financial flexibility and increased dependence on foreign investors that would accompany high and rising debt could weaken U.S. international leadership.

Greater Chance of a Fiscal Crisis

A large and growing federal debt would increase the chance of a fiscal crisis in the United States—a situation in which it would become increasingly difficult to finance federal borrowing and investors would have to be compensated with continuously increasing interest

8. The federal funds rate is the interest rate financial institutions charge each other for overnight loans of their monetary reserves.

9. See Congressional Budget Office, *How the Supply of Labor Responds to Changes in Fiscal Policy* (October 2012), www.cbo.gov/publication/43674.

10. For more information, see Congressional Budget Office, *The Macroeconomic and Budgetary Effects of Federal Investment* (June 2016), www.cbo.gov/publication/51628.

rates.[11] Those concerns could perpetuate a cycle: Higher interest rates would increase concerns over repayment, which would continue to raise interest rates even further. Even in the absence of a full-blown crisis, such risks would lead to higher rates and borrowing costs for the U.S. government and the private sector.

In a fiscal crisis, dramatic increases in Treasury rates would reduce the market value of outstanding government securities, and the resulting losses—for mutual funds, pension funds, insurance companies, banks, and other holders of government debt—could be large enough to cause some financial institutions to fail. Because the United States currently benefits from the U.S. dollar being the world's reserve currency and because the federal government borrows in dollars, it is less likely that a sudden fiscal crisis would lead to a catastrophic financial crisis similar to those that befell Argentina, Greece, or Ireland. As one example, in the event of a dramatic increase in interest rates, the Federal Reserve could buy Treasury securities and thereby limit losses to bondholders. However, such moves, if extensive, would ultimately lead to high inflation, a sharp depreciation in the value of the dollar, or both.[12] Those developments would reduce the value of U.S. assets.

No one can accurately predict whether or when a fiscal crisis might occur in the United States or how it would unfold. In particular, the debt-to-GDP ratio has no identifiable tipping point to indicate that a crisis is likely or imminent. Nonetheless, a large and rising federal debt would almost certainly increase the risk of a fiscal crisis.

The likelihood of a fiscal crisis also depends on economic conditions. If investors anticipate continued economic growth and low interest rates, they are generally less concerned about the government's debt burden. Conversely, substantial debt can reinforce a more generalized concern about the economy. Thus, fiscal crises around the world often have begun during recessions and, in turn, have exacerbated them.

If a fiscal crisis occurred in the United States, policymakers would have limited—and unappealing—options for responding. The government would need to undertake some combination of three approaches: restructure the debt (that is, seek to modify the contractual terms of existing obligations), use monetary policy to raise inflation above expectations, or implement large and abrupt spending cuts or tax increases.

Demographic and Economic Trends That Underlie CBO's Long-Term Projections

Demographic and economic projections are key determinants of the long-term budget outlook. Through 2028, the projections in this report are the same as those that underlie CBO's 10-year baseline; for later years, the agency projects conditions according to its assessment of long-term trends. (Appendix A describes CBO's demographic and economic projections.) In addition, the economic projections take into account the effects that projected fiscal policies—in particular, increased federal borrowing and rising effective marginal tax rates—would have on the economy. Such effects would result in a smaller labor supply, a smaller stock of capital, and lower output than would otherwise be the case.

Demographic Projections

The size and age profile of the U.S. population affect the federal budget and the nation's economy. For example, the composition of the population influences the size of the labor force and the number of beneficiaries of Social Security and other federal programs. In CBO's projections, the U.S. population increases from 332 million at the beginning of this year to 392 million in 2048, expanding by 0.6 percent per year, on average. That annual rate of growth is slower than the rate of the past 50 years (0.9 percent). The share of the population age 65 or older also rises over the coming decades, maintaining a long-standing historical trend. By 2048, 22 percent of the population would be age 65 or older, compared with 16 percent today (see Figure 4).

To estimate growth in the U.S. population, CBO projects rates of fertility, immigration, and mortality. The total fertility rate is calculated as the sum of fertility rates for women between 15 and 49 in a given year and represents the average number of children that a woman would have in her lifetime.[13] In general, that rate tends to decline during recessions and rebound during recoveries. Instead of rebounding after the

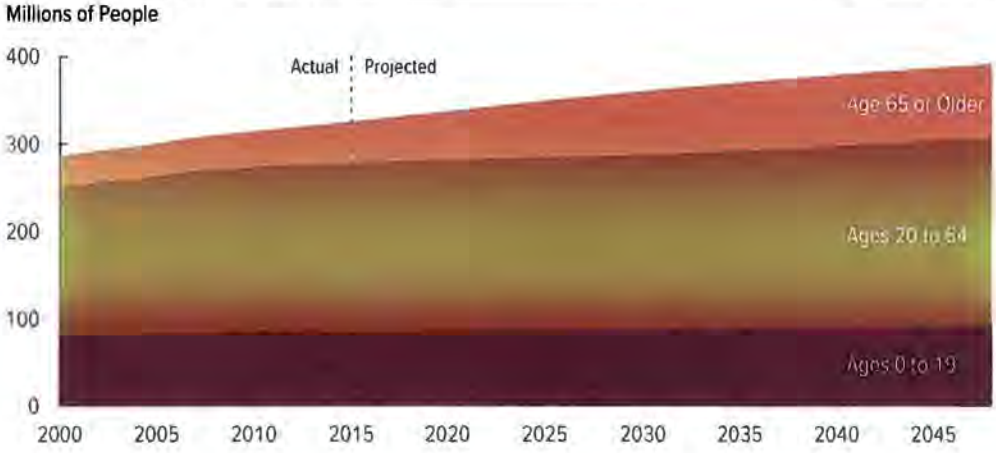
11. For more information, see Congressional Budget Office, *Federal Debt and the Risk of a Fiscal Crisis* (July 2010), www.cbo.gov/publication/21625. That report points out, for example, that during past fiscal crises, Argentina, Greece, and Ireland were forced to make difficult choices in the face of sharp increases in interest rates on government debt.

12. Over time, such currency debasement would erode the status of the U.S. dollar as the world's reserve currency.

13. The total fertility rate can also be defined as the average number of children that a woman would have if, in each year of her life, she experienced the birth rates observed or assumed for that year and if she survived her entire childbearing period.

Figure 4.

Population, by Age Group



The share of the population age 65 or older is projected to rise over the coming decades, maintaining a long-standing historical trend.

Source: Congressional Budget Office.

This figure shows actual data through calendar year 2015, the most recent year for which such data are available.

2007–2009 recession, however, the fertility rate fell. In 2007, the rate was 2.1 births per woman, but it declined to 1.9 by 2010 and has remained below that point since then. CBO expects the total fertility rate to be 1.9 for the next 30 years.[14]

Under current law, the rate of net annual immigration to the United States is expected to rise slightly over the next three decades. CBO projects that rate would inch up from an average of 3.1 per thousand people in the U.S. population over the next decade to 3.2 in 2048. That rate, which accounts for anyone who either enters or leaves the United States in any year, is slightly higher than the average net annual immigration rates since the end of the 2007–2009 recession. On balance, CBO projects that the increase in net annual immigration over the next decade would be mostly driven by higher numbers of legal permanent residents. The annual increase in the number of legal temporary and unauthorized immigrants is projected to be relatively steady over the next 10 years. Beyond 2028, the annual average rate of growth is the same for different categories of immigrants in CBO's projections. Using that simplified approach, CBO projects that net annual immigration would grow at an average rate of 0.6 percent annually through 2048, slightly faster than the average rate of growth in the U.S. population overall.[15]

Mortality rates are projected to improve over the next 30 years, on average. Those rates, which measure the number of deaths per thousand people in the population, are projected to decline at the same rates that were recorded for each age and sex group from 1950 to 2014. Improved, or lower, mortality rates mean higher life expectancy. CBO projects an average life expectancy at birth of 82.8 years in 2048, compared with 79.2 years in 2018.[16] Similarly, CBO projects life expectancy at age 65 in 2048 to be 21.7 years, or 2.2 years longer than life expectancy at age 65 in 2018.

Economic Projections

The performance of the U.S. economy in coming decades will affect the federal government's spending, revenues, and debt accumulation. CBO makes its economic projections by projecting trends in key economic

14. Recent data show that low total fertility rates have persisted since the recession, remaining below 1.9. See Brady E. Hamilton and others, *Births: Provisional Data for 2017*, Vital Statistics Rapid Release Report 4 (National Center for Health Statistics, May 2018), www.cdc.gov/nchs/nvss/vsrr/reports.htm.

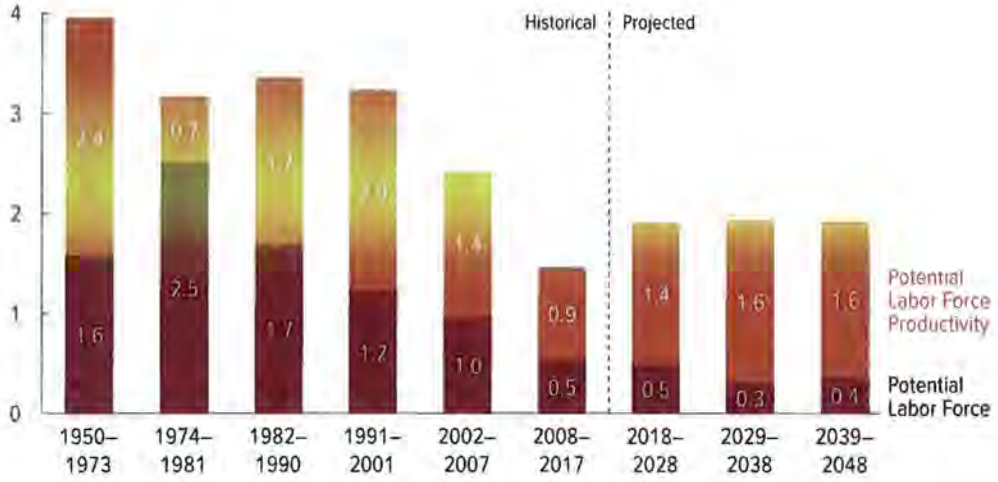
15. That rate is based on the Census Bureau's projections for late in the coming decade. See Census Bureau, "2014 National Population Projections: Summary Tables," Table 1, https://go.usa.gov/xQAbu. The Census Bureau has recently released a new set of projections, but information from those projections has not been incorporated in this analysis. In those projections, the population is slightly smaller than the Census Bureau projected in 2014.

16. Life expectancy as used here is period life expectancy, which is the amount of time that a person in a given year would expect to survive beyond his or her current age on the basis of that year's mortality rates for various ages.

Figure 5.

Average Annual Growth of Real Potential GDP in CBO's Extended Baseline

Percent



Growth in potential GDP is projected to be slower than it has been in the past, driven mostly by slower growth of the labor force.

Source: Congressional Budget Office.

Real potential GDP is the maximum sustainable output of the economy adjusted to remove the effects of inflation. The two contributing factors are potential labor force productivity (the ratio of potential GDP to the potential labor force) and the potential labor force (the labor force adjusted for ups and downs in the business cycle).

GDP = gross domestic product.

variables, such as the size and composition of the labor force, capital accumulation, productivity, inflation, and interest rates. The agency also considers ways in which fiscal policy influences economic activity.

In CBO's projections, growth in potential (maximum sustainable) GDP in the future is slower than it has been over the past 50 years. Under its extended baseline, CBO projects an increase in real potential GDP of 1.9 percent per year, on average, over the next 30 years, compared with its historical growth rate of 2.8 percent. That slower economic growth is attributable to several factors—most notably, slower growth of the potential labor force (the labor force adjusted for ups and downs in the business cycle). In CBO's projections, the potential labor force grows by 0.4 percent per year, on average, through 2048 (see Figure 5); the average annual growth rate over the 1968–2017 period was 1.5 percent. That slower projected growth of the potential labor force mainly results from the aging of the population and the relative stability (after rising for decades) in the share of women participating in the labor force.[17]

In CBO's projections, total factor productivity grows more slowly than its historical average, increasing by 1.2 percent per year, on average, from 2018 to 2048. That rate, which measures the average real output per unit of combined labor and capital services, is slower than the annual average of 1.5 percent since 1950. Factors influencing that projection include slower productivity growth over the past several decades (except during a period of rapid growth in the late 1990s and early 2000s), modest growth in labor quality (a measure of workers' skills), and a projected reduction in federal investment as a share of GDP. Potential labor productivity—defined as real potential output per potential hour of labor—is likewise projected to grow more slowly than it has in the past, reflecting less

17. For more details about how CBO projects labor force participation rates, see Joshua Montes, *CBO's Projection of Labor Force Participation Rates*, Working Paper 2018-04 (Congressional Budget Office, March 2018), www.cbo.gov/publication/53616.

private investment in capital goods. Since 1950, labor productivity has expanded by 1.7 percent per year, on average; through 2048, that growth rate is projected to average 1.5 percent per year (see Figure 5).

Interest rates, in CBO's projections, rise as the economy continues to expand but remain lower than they have been historically. Slower growth of the labor force and lower inflation push interest rates down from their historical levels, and those factors are projected to outweigh the effects of rising federal debt and other factors that tend to push interest rates up. In CBO's latest economic projections, the interest rate on 10-year Treasury notes rises from 2.4 percent at the end of 2017 to 3.7 percent in 2028. That rate is projected to rise to 4.8 percent in 2048—1 percentage point below the 5.8 percent average recorded over the 1990–2007 period. (That period is used for comparison because it was characterized by fairly stable expectations for inflation and by a lack of significant financial crises or severe economic downturns.)

The average interest rate on all federal debt held by the public tends to be lower than the rate on 10-year Treasury notes. (Interest rates generally are lower on shorter-term debt than on longer-term debt, and the average term to maturity of federal debt has been less than 10 years since the 1950s.) Based on projections of interest rate spreads and the term structure of rates on federal debt, the average interest rate on federal debt is projected to be about 0.4 percentage points lower than the interest rate on 10-year Treasury notes after 2028.[18] As a result, in CBO's projections, the average interest rate on federal debt rises to 4.4 percent by 2048.

CBO's economic projections incorporate the macroeconomic effects of federal tax and spending policies. In particular, the agency projects that increased borrowing by the federal government under current law generally would crowd out some private investment in productive capital in the long term. Less private investment in capital goods would make workers less productive, leading to lower wages and a smaller supply of labor. Furthermore, the extended baseline incorporates the economic effects of higher marginal tax rates. As more income is pushed into higher tax brackets over time, labor and capital income face higher tax rates. Higher marginal tax rates on labor income would lessen people's incentive to work, and the increase in the marginal tax rate on capital income would reduce their incentive to save. All told, less private domestic investment and a smaller labor supply would result in lower economic output and income than would otherwise be the case.

Projected Spending Through 2048

Spending for all of the government's programs and activities, combined with net interest costs, is projected to account for a larger percentage of GDP in coming years than it has, on average, over the past 50 years. From 1968 to 2017, federal outlays other than those for the government's net interest costs averaged 18 percent of GDP. The percentage was higher over the past decade, when noninterest spending averaged 20 percent of GDP, because of underlying demographic trends and because of temporary conditions in the economy (namely, the financial crisis, the weak recovery, and the federal policies that were created to address those circumstances). Under current law, noninterest outlays are projected to rise from 19 percent in 2018 to 20 percent in 2028 (adjusted to exclude shifts in timing; the share would be 21 percent if timing shifts were included). Over the next decade, mandatory spending (which includes spending on Social Security and the major health care programs, along with many smaller programs) is generally projected to increase as a share of the economy, and discretionary spending is generally projected to decrease.

After 2028, under the assumptions that govern the extended baseline, noninterest spending would continue to rise relative to the size of the economy, reaching 23 percent of GDP by 2048. (For a summary of CBO's assumptions about spending and revenues, see Table 2.) That increase would mostly result from larger outlays for the two biggest mandatory programs: Social Security and Medicare (see Figure 6).

Under current law, net interest costs would rise from 1.6 percent of GDP in 2018 to 3.1 percent in 2028, CBO projects, as debt accumulates and as interest rates increase from their currently low levels. By 2048, net interest costs would equal 6.3 percent of GDP, boosting total federal spending to 29 percent of GDP. Spending has exceeded that amount only once, for a three-year period during World War II. For those years, when

18. Term structure is the relationship between interest rates or bond yields and different terms or maturities.

Table 2.

Assumptions About Spending and Revenues Underlying CBO's Extended Baseline

	Assumptions About Spending
Social Security	As scheduled under current law[a]
Medicare	As scheduled under current law through 2028; thereafter, projected spending depends on the estimated number of beneficiaries and health care costs per beneficiary (for which excess cost growth is projected to move smoothly to a rate of 1.0 between 2029 and 2048)[a]
Medicaid	As scheduled under current law through 2028; thereafter, projected spending depends on the estimated number of beneficiaries and health care costs per beneficiary (for which excess cost growth is projected to move smoothly to a rate of 1.0 between 2029 and 2048)
Children's Health Insurance Program	As projected in CBO's baseline through 2028; constant as a percentage of GDP thereafter
Subsidies for Health Insurance Purchased Through the Marketplaces Established Under the Affordable Care Act	As scheduled under current law through 2028; thereafter, projected spending depends on the estimated number of beneficiaries, an additional indexing factor for subsidies, and excess cost growth for private health insurance premiums (which is projected to move smoothly to an annual rate of 1.0 between 2029 and 2048)
Other Mandatory Spending	As scheduled under current law through 2028; thereafter, refundable tax credits are estimated as part of revenue projections, and the rest of other mandatory spending is assumed to decline as a percentage of GDP at roughly the same annual rate at which it is projected to decline between 2023 and 2028[b]
Discretionary Spending	As projected in CBO's baseline through 2028; roughly constant as a percentage of GDP thereafter[c]
	Assumptions About Revenues
Individual Income Taxes	As scheduled under current law
Payroll Taxes	As scheduled under current law
Corporate Income Taxes	As scheduled under current law
Excise Taxes	As scheduled under current law[d]
Estate and Gift Taxes	As scheduled under current law
Other Sources of Revenues	As scheduled under current law through 2028; constant as a percentage of GDP thereafter

Source: Congressional Budget Office.

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections through 2028 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

For CBO's most recent 10-year baseline projections, see Congressional Budget Office, *An Analysis of the President's 2019 Budget* (May 2018), www.cbo.gov/publication/53884.

Excess cost growth refers to the extent to which the growth rate of nominal health care spending per person—adjusted for demographic characteristics of the relevant populations—exceeds the growth rate of potential GDP per person. (Potential GDP is the maximum sustainable output of the economy.)

GDP = gross domestic product.

a. Assumes the payment of full benefits as calculated under current law, regardless of the amounts available in the program's trust funds.

b. In that projection, GDP includes the macroeconomic effects of the policies underlying the extended baseline. If it did not, the rest of other mandatory spending after 2028 would decline at the same rate at which it is projected to decline between 2023 and 2028 (excluding the decline in spending for the Supplemental Nutrition Assistance Program).

c. In that projection, GDP includes the macroeconomic effects of the policies underlying the extended baseline. If it did not, discretionary spending after 2028 would remain the same (measured as a percentage of GDP) as the amount projected for 2028.

d. The exception to the current-law assumption applies to expiring excise taxes dedicated to trust funds. The Balanced Budget and Emergency Deficit Control Act of 1985 requires CBO's baseline to reflect the assumption that those taxes would be extended at their current rates. That law does not stipulate that the baseline include the extension of other expiring tax provisions, even if they have been routinely extended in the past.

Figure 6.

Spending and Revenues in the Past and in CBO's Extended Baseline

Percentage of Gross Domestic Product

Source: Congressional Budget Office.

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections through 2028 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

a. Consists of spending for Medicare (net of premiums and other offsetting receipts), Medicaid, and the Children's Health Insurance Program, as well as outlays to subsidize health insurance purchased through the marketplaces established under the Affordable Care Act and related spending.

b. Consists of all federal spending other than that for Social Security, the major health care programs, and net interest.

c. Consists of excise taxes, remittances to the Treasury from the Federal Reserve System, customs duties, estate and gift taxes, and miscellaneous fees and fines.

defense spending increased sharply, total federal spending topped 40 percent.

CBO projects that the growth in spending for Social Security, the major health care programs, and net interest would continue to reshape the spending patterns of the U.S. government (see Figure 7). Spending for net interest would account for a much greater portion of total federal spending by 2048 than it does today, and spending on Social Security and the major health care programs would account for a much larger share of all federal noninterest spending.

Spending for Social Security and the Major Health Care Programs

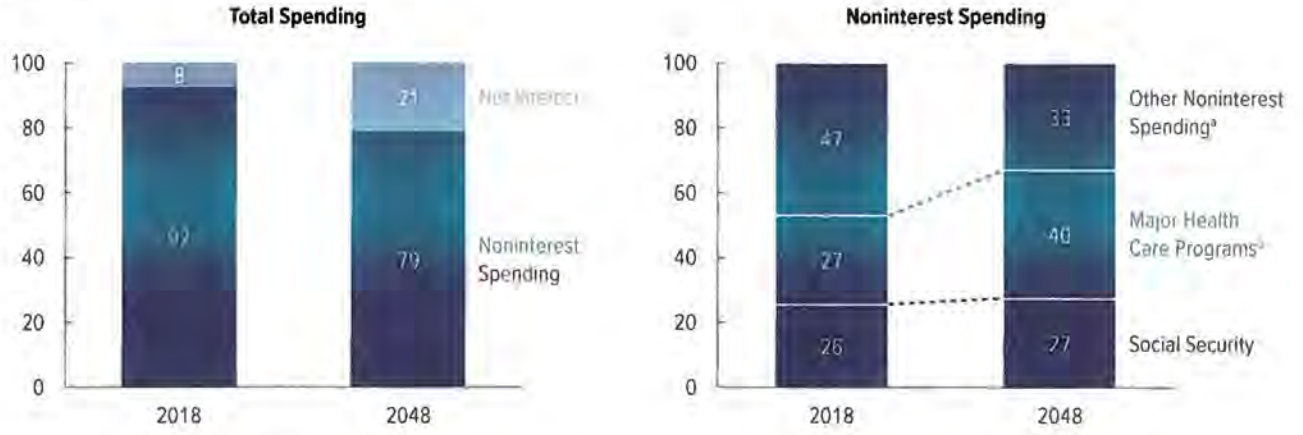
Mandatory programs have accounted for a rising share of the federal government's noninterest spending over the past few decades. Most of the growth has occurred because Social Security and Medicare provide benefits mainly to people age 65 or older, a group that has been growing significantly.

Social Security. Created in 1935, Social Security is the largest single program in the federal budget. Its two components pay benefits to 62 million people in all.

Figure 7.

Composition of Federal Spending in CBO's Extended Baseline

Percent



Source: Congressional Budget Office.

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections through 2028 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

a. Consists of all federal spending other than that for Social Security, the major health care programs, and net interest.

b. Consists of spending for Medicare (net of premiums and other offsetting receipts), Medicaid, and the Children's Health Insurance Program, as well as outlays to subsidize health insurance purchased through the marketplaces established under the Affordable Care Act and related spending.

The larger of the two, Old-Age and Survivors Insurance (OASI), pays benefits to retired workers, to their eligible dependents, and to some survivors of deceased workers. The smaller program, Disability Insurance (DI), makes payments to disabled workers and to their dependents until those workers are old enough to claim full retirement benefits under OASI.

Under current law, CBO projects, spending for Social Security would increase noticeably as a share of the economy, continuing the trend of the past five decades. That spending would increase from 4.9 percent of GDP in 2018 to 6.3 percent in 2048 (see Figure 6 on page 15), and the number of beneficiaries would rise from 62 million to nearly 99 million. In CBO's extended baseline projections, Social Security is assumed to pay benefits as scheduled under current law, regardless of the status of the program's trust funds.[19] That approach is consistent with a statutory requirement that CBO's 10-year baseline projections incorporate the assumption that funding for such programs is adequate to make all payments required by law.[20]

The Social Security program is funded by dedicated tax revenues from two sources. Currently, 96 percent comes from a payroll tax; the rest is collected from income taxes on Social Security benefits. Revenues from the payroll tax and the tax on benefits are credited to the Old-Age and Survivors Insurance Trust Fund and the Disability Insurance Trust Fund, which finance the program's benefits.

A common measure of the sustainability of a program that has a trust fund and a dedicated revenue source is its estimated actuarial balance over a given period—that

19. The balances of the trust funds represent the total amount that the government is legally authorized to spend for those purposes. For more details about the legal issues related to exhaustion of a trust fund, see Noah P. Meyerson, *Social Security: What Would Happen If the Trust Funds Ran Out?* Report for Congress RL33514 (Congressional Research Service, August 28, 2014), available from U.S. House of Representatives, Committee on Ways and Means, *2014 Green Book*, Chapter 1: Social Security, "Social Security Congressional Research Service Reports" (accessed April 19, 2018), http://go.usa.gov/cCXcG.

20. Sec. 257(b)(1) of the Balanced Budget and Emergency Deficit Control Act of 1985 (Deficit Control Act), Public Law 99-177 (codified at 2 U.S.C. §907(b)(1) (2016)).

is, the sum of the present value of projected tax revenues and the current trust fund balance minus the sum of the present value of projected outlays and a year's worth of benefits at the end of the period.[21] For Social Security, that difference is traditionally presented as a percentage of the present value of taxable payroll over 75 years.[22]

Over the next 75 years, if current laws remained in place, the program's actuarial shortfall would be 1.5 percent of GDP, or 4.4 percent of taxable payroll, CBO projects (see Table 3).[23] According to CBO's projections, therefore, it would be possible to pay the benefits prescribed by current law and maintain the necessary trust fund balances through 2092 if payroll taxes were raised immediately and permanently by about 4.4 percent of taxable payroll, if scheduled benefits were reduced by an equivalent amount, or if some combination of tax increases and spending reductions of equal present value was adopted.[24]

Table 3.

Financial Measures for Social Security

Projection Period (Calendar years)	Income Rate	Cost Rate	Actuarial Balance (Difference)
	As a Percentage of Gross Domestic Product		
25 Years (2018 to 2042)	5.1	6.2	-1.0
50 Years (2018 to 2067)	4.8	6.2	-1.4
75 Years (2018 to 2092)	4.7	6.2	-1.5
	As a Percentage of Taxable Payroll		
25 Years (2018 to 2042)	14.6	17.5	-2.9
50 Years (2018 to 2067)	14.0	18.0	-4.0
75 Years (2018 to 2092)	13.9	18.3	-4.4

Source: Congressional Budget Office.

These projections incorporate the assumption that spending for Social Security continues as scheduled even if its trust funds are exhausted. Through 2048, the projections incorporate macroeconomic feedback caused by rising federal debt and marginal tax rates. After 2048, they do not account for such feedback.

Over each projection period, the income rate is the present value of annual tax revenues plus the initial trust fund balance, and the cost rate is the present value of annual outlays plus the present value of a year's worth of benefits as a reserve at the end of the period, each divided by the present value of gross domestic product or taxable payroll. (The present value of a flow of revenues or outlays over time expresses that flow as a single amount received or paid at a specific time. The present value depends on a rate of interest, known as the discount rate, that is used to translate past and future cash flows into current dollars.) The actuarial balance is the difference between the income and cost rates.

Another commonly used measure of Social Security's sustainability is a trust fund's date of exhaustion. CBO projects that, under current law, the DI trust fund would be exhausted in fiscal year 2025 and the OASI trust fund would be exhausted in calendar year 2032. If their balances were combined, the OASDI trust funds would be exhausted in calendar year 2031, according to CBO's estimate.

The Major Health Care Programs. Outlays for the major health care programs consist of spending for Medicare, Medicaid, and the Children's Health Insurance Program (CHIP), as well as outlays to subsidize health insurance purchased through the marketplaces established under the Affordable Care Act (ACA) and related spending.[25] Medicare, which provides health insurance to about

21. A present value expresses a flow of past and future income or payments as a single amount received or paid at a specific time. The value depends on the rate of interest, known as the discount rate, used to translate past and future cash flows into current dollars at that time. To account for the difference between a trust fund's current balance and the balance desired for the end of the period, the balance at the beginning is added to the projected tax revenues, and an additional year of costs at the end of the period is added to projected outlays.

22. Taxable payroll is the total amount of earnings (wages and self-employment income) for employment covered by Social Security that is below the applicable annual taxable maximum ($128,400 in 2018).

23. The 75-year projection period used here begins in calendar year 2018 and ends in calendar year 2092. The Social Security trustees have estimated that the program's 75-year actuarial shortfall would be 2.8 percent of taxable payroll, which is about 1.6 percentage points less than CBO's projection. For details on the trustees' projections, see Social Security Administration, *The 2018 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds* (June 2018), www.ssa.gov/oact/tr/2018.

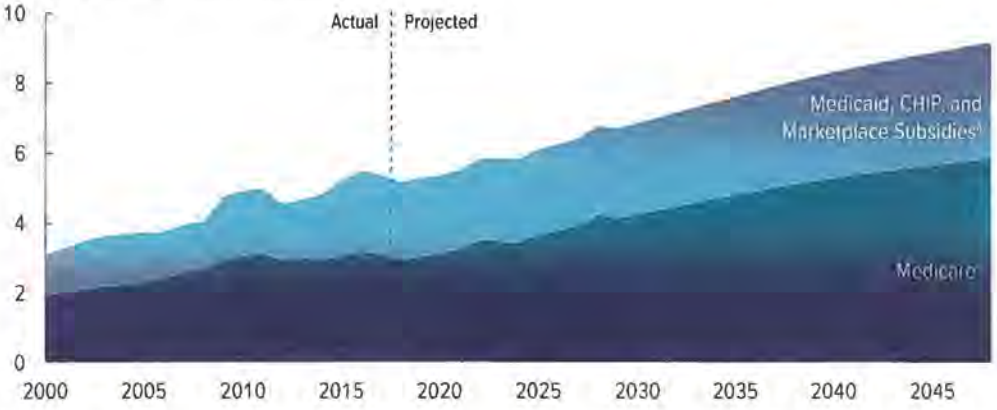
24. A policy that either increased revenues or reduced outlays by the same percentage of taxable payroll each year that would be required to eliminate the 75-year shortfall would not necessarily place Social Security on a permanently stable financial path. Estimates of the actuarial shortfall do not account for revenues or outlays after the 75-year projection period. Because shortfalls are smaller earlier in the 75-year projection period than they are later, such a policy would create surpluses in the next several decades but result in deficits later and leave the system financially unbalanced after calendar year 2092. Additionally, the calculation of the actuarial balance excludes the effects of any macroeconomic feedback that would result from an increase in taxes or a reduction in benefits.

25. Spending related to subsidies for insurance purchased through the marketplaces includes spending for subsidies for insurance provided through the Basic Health Program and spending for the risk-adjustment and reinsurance programs that were established by the ACA to stabilize premiums for health insurance purchased by individuals and small employers.

Figure 8.

Federal Spending on the Major Health Care Programs, by Category

Percentage of Gross Domestic Product



Medicare spending, net of offsetting receipts, would account for about three-quarters of the increase in spending for the major health care programs over the next 30 years.

Source: Congressional Budget Office.

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections through 2028 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

CHIP = Children's Health Insurance Program; GDP = gross domestic product.

a. "Marketplace Subsidies" refers to spending to subsidize health insurance purchased through the marketplaces established under the Affordable Care Act and insurance provided through the Basic Health Program, as well as spending to stabilize premiums for health insurance purchased by individuals and small employers.

b. Refers to net spending for Medicare, which accounts for offsetting receipts that are credited to the program. Those offsetting receipts are mostly premiums paid by beneficiaries to the government.

59 million people (most of whom are at least 65 years old), accounts for more than half of that spending.

CBO projects federal spending for the government's major health care programs for 2018 through 2028 under the assumption that the laws governing those programs will, in general, remain unchanged. As with Social Security, CBO assumes that Medicare will pay benefits as scheduled under current law, regardless of the amounts in the program's trust funds. For longer-term projections, considerable uncertainty surrounds the evolution of health care delivery and financing systems. That uncertainty leads CBO to employ a formulaic approach for its projections beyond 2028: It combines estimates of the number of expected beneficiaries of the government's health care programs with mechanical estimates of the growth in spending per beneficiary.

Over the past five decades, spending for the major health care programs has steadily grown faster than the economy, and that trend continues in CBO's extended baseline. In 2018, net federal spending for the major health care programs is estimated to equal 5.2 percent of GDP, CBO projects. If current laws generally remained in place, net outlays for those programs would increase to 9.2 percent in 2048, with Medicare spending, net of offsetting receipts (mostly premiums paid by enrollees), growing by about 3 percent of GDP, and spending on Medicaid and CHIP, combined with outlays for marketplace subsidies and related spending, growing by about 1 percent of GDP (see Figure 8).[26]

Causes of Growth in Spending for Social Security and the Major Health Care Programs

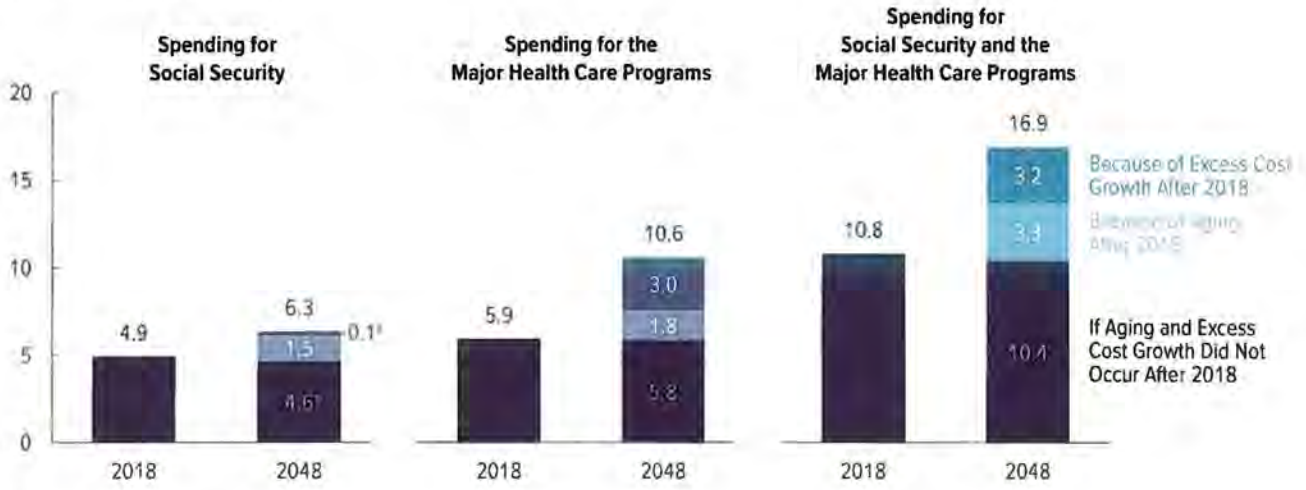
The aging of the population and rising health care costs per person are reasons for the sharp rise in projected spending for Social Security and the major federal health care programs over the next 30 years. The extent to which health care costs per person, adjusted for demographic changes, grow faster than potential GDP per person is known as excess cost growth.

26. In CBO's projections, the outlays for subsidies for insurance purchased through the marketplaces and related spending are presented in combination with outlays for Medicaid and CHIP. Most of those outlays constitute federal subsidies for health insurance for low- and moderate-income households.

Figure 9.

Spending Growth in Social Security and the Major Health Care Programs in CBO's Extended Baseline

Percentage of Gross Domestic Product



Source: Congressional Budget Office.

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections through 2028 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

Outlays for the major health care programs consist of gross spending for Medicare (which does not account for offsetting receipts that are credited to the program), Medicaid, and the Children's Health Insurance Program, as well as outlays to subsidize health insurance purchased through the marketplaces established under the Affordable Care Act and related spending. Those outlays have been adjusted to exclude the effects of shifting payments from one fiscal year into another so that those payments are not made on a weekend.

Excess cost growth refers to the extent to which the growth rate of nominal health care spending per person—adjusted for demographic characteristics of the relevant populations—exceeds the growth rate of potential gross domestic product per person. (Potential gross domestic product is the maximum sustainable output of the economy.)

This figure highlights the most important effects of aging and excess cost growth.

a. Excess cost growth accounts for a small portion of the increase in spending for Social Security as a share of GDP in 2048 because greater spending on federal health care programs leads to larger deficits, which in turn slow the growth of GDP.

b. If aging and excess cost growth did not occur after 2018, spending on Social Security as a share of GDP would be lower in 30 years, mainly because of the scheduled increase in the full retirement age for Social Security.

In developing its projections, if CBO had set the shares of the population by age at today's proportions and had set excess cost growth at zero, spending on those programs as a share of GDP in 2048 would be 0.4 percentage points below the 10.8 percent estimated for 2018 (adjusted to exclude shifts in timing).[27] In the extended baseline, however, that spending reaches 16.9 percent of GDP by 2048 (see Figure 9).[28] Aging accounts for an increase of 3.3 percentage points, or roughly half of the difference. Excess cost growth, at an increase of 3.2 percentage points, accounts for the other half.

The Aging Population. In CBO's projections, the aging of the baby-boom generation and continued gains in life expectancy increase the share of the population that is age 65 or older from 16 percent to 22 percent between 2018 and 2048.

Aging accounts for nearly all of the projected long-term increase in Social Security spending as a percentage of

27. Excluding aging and excess cost growth, spending on those programs as a percentage of GDP would be lower in 30 years, mainly because of the scheduled increase in the full retirement age for Social Security.

28. This analysis of causes of spending growth includes gross spending on Medicare.

GDP.[29] Because of growth in the share of the population that is 65 or older, a larger segment of the population will consist of Social Security beneficiaries, and their benefits will require greater federal spending.

Aging also contributes to the projected increase in the share of GDP taken up by spending for the major health care programs, particularly Medicare, which is the largest such program. Most beneficiaries qualify for Medicare at age 65. As that group becomes larger and older, on average, Medicare spending will increase because the number of beneficiaries will rise and because people tend to require more health care as they age. In CBO's projections for the 2018–2048 period, aging explains about one-third of the increase in spending for the major health care programs as a share of GDP.

Rising Health Care Costs per Person. Even though growth in health care costs per person has slowed recently, over the next 30 years it is projected to still be faster than growth in potential GDP per person. In CBO's extended baseline, excess cost growth accounts for about two-thirds of the increase in spending for the major health care programs as a share of GDP between 2018 and 2048. Such cost growth also leads to greater federal debt, which slows the growth of GDP and slightly raises projected spending as a share of GDP.

Other Noninterest Spending

In the extended baseline, total federal spending for everything other than Social Security, the major health care programs, and net interest declines to a smaller percentage of GDP than has been the case for more than 70 years. During the past 50 years, such spending has averaged 11 percent of GDP, but it has been as high as 15 percent (in 1968) and as low as 8 percent (in the late 1990s and early 2000s). Other noninterest spending in 2018 is estimated to equal 8.9 percent of GDP. Under the assumptions used for this analysis, that spending is projected to fall to 7.9 percent of GDP in 2028 and to 7.6 percent of GDP in 2048.

Discretionary Spending. About half of all discretionary spending is dedicated to national defense, and the rest is for an array of federally funded investments and activities, including education, transportation, housing assistance, veterans' health care, health-related research and public programs, administration of justice, and international affairs.

Over the past half-century, discretionary spending has diminished markedly as a percentage of GDP: Between 1968 and 2017, it declined from 13.1 percent to 6.3 percent. In CBO's baseline, discretionary outlays remain at about that level through next year before decreasing again, to 5.4 percent of GDP by 2028.

Through 2021, most discretionary funding is limited by caps on annual discretionary appropriations that were originally specified in the Budget Control Act of 2011 (P.L. 112-25, as amended). The Bipartisan Budget Act of 2018 increased limits on discretionary funding that otherwise would have been in place for 2018 and 2019. The subsequent decline in discretionary outlays relative to GDP reflects lower statutory limits on discretionary funding in 2020 and 2021 and the assumption (required by law) that discretionary funding will grow at the rate of inflation—which is slower than projected growth in GDP—beginning in 2022. After 2028, in CBO's extended baseline projections, discretionary spending is assumed to remain roughly constant as a percentage of GDP (see Figure 10).[30]

Other Mandatory Spending. Since the mid-1960s, mandatory spending other than that for Social Security and the major health care programs has generally remained between 2 percent and 4 percent of GDP. (An exception was the spike to 5.1 percent in 2009 because of higher spending in response to the severe recession.) That category of mandatory spending includes retirement programs for federal civilian and military employees, certain veterans' programs, the Supplemental Nutrition Assistance Program (SNAP), Supplemental Security

29. Excess cost growth accounts for a small portion of the increase in spending for Social Security as a share of GDP in 2048, amounting to about 0.1 percent of GDP, because greater spending on federal health care programs leads to larger deficits, which in turn slow the growth of GDP.

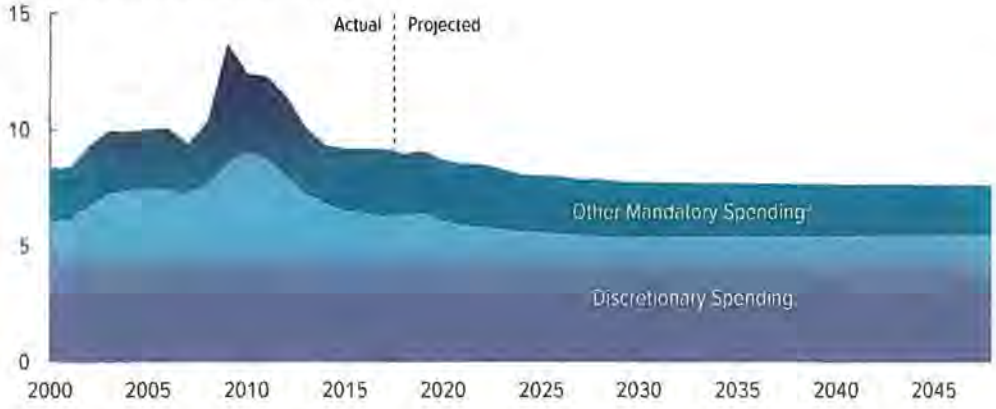
30. CBO assumed that discretionary spending after 2028 would remain constant as a percentage of GDP before the agency accounted for the effect on the economy of the fiscal policies projected under the extended baseline. Because CBO estimates that fiscal policy under the extended baseline would dampen economic growth, its projection of discretionary spending would not grow at precisely the same rate as GDP.

Although discretionary spending would decline relative to GDP from 2018 to 2028 in CBO's projections, historical evidence suggests that such a decline is unlikely to persist: Discretionary spending has historically been a larger share of economic output than it is projected to be in 2028. For that reason, CBO did not assume that the share would decline further.

Figure 10.

Other Federal Noninterest Spending in CBO's Extended Baseline

Percentage of Gross Domestic Product



Measured as a percentage of economic output, other federal noninterest spending in CBO's extended baseline declines between 2018 and 2048, mainly because of a projected decrease in discretionary spending over the next decade.

Source: Congressional Budget Office.

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections through 2028 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

a. "Other Mandatory Spending" is all mandatory spending other than that for Social Security and the major health care programs. It includes the refundable portions of the earned income and child tax credits and of the American Opportunity Tax Credit.

Income, unemployment compensation, and refundable tax credits.[31]

Other mandatory spending is projected to decline slightly as a share of the economy over the next 10 years. That category accounts for 2.6 percent of GDP today and, if current laws generally remained unchanged, it would decline to 2.4 percent of GDP in 2028, CBO projects.[32] That small decrease primarily reflects the effects of growth in average income on eligibility for some programs and refundable tax credits as well as reductions in the average payment per beneficiary (when measured relative to average income) for certain large programs.

In CBO's extended baseline, other mandatory spending is projected to fall to 2.1 percent of GDP by 2048. In part, that reduction reflects the effects of further growth in income on eligibility for refundable tax credits. It also reflects the assumption that other mandatory spending, excluding outlays for such tax credits, would decline roughly in line with projections for such spending between 2023 and 2028.[33]

Net Interest Costs

Over the past 50 years, the government's net interest costs have averaged 2.0 percent of GDP, although they have been as high as 3.2 percent and as low as 1.2 percent. In CBO's extended baseline, net interest costs are projected to roughly double as a share of the economy over the next decade—from 1.6 percent of GDP in 2018 to 3.1 percent by 2028—as greater federal borrowing boosts debt-service costs and as currently low interest

31. Refundable tax credits reduce a filer's overall income tax liability; if the credit exceeds the rest of the filer's income tax liability, the government pays all or some portion of that excess to the taxpayer (and the payment is treated as an outlay in the budget). See Congressional Budget Office, *Refundable Tax Credits* (January 2013), www.cbo.gov/publication/43767.

32. Sec. 257(b)(2) of the Deficit Control Act, which governs CBO's baseline projections, makes exceptions regarding current law for some programs, such as SNAP, that have expiring authorizations but that are assumed to continue as currently authorized.

33. For the years after 2028, mandatory spending excluding that for Social Security, the major health care programs, and refundable tax credits was not projected in detail because of the number of programs involved and the variety of factors that influence spending on them. Instead, CBO used an approximate method to project spending for those programs as a group. Except for the outlays for refundable tax credits, such spending is assumed to decline relative to GDP (excluding any effects that fiscal policy may have on the economy) after 2028 at the same rate at which it is projected to fall between 2023 and 2028 (excluding the decrease in spending for SNAP).

rates rise. In the extended baseline, those costs reach 6.3 percent of GDP by 2048, a higher amount than has ever been experienced (see Figure 6 on page 15). Those costs would exceed mandatory spending other than that for Social Security and the major health care programs in the next few years, exceed all discretionary spending by 2045, and be about equal to spending for Social Security by 2048.

In CBO's projections, deficits and debt rise because of the growing gap between spending and revenues, and higher interest costs are a major contributor to that growing gap. Between 2018 and 2048, more than half of the increase in spending as a percentage of GDP results from higher net interest costs. In large part, those rising interest costs stem from increases in interest rates that reflect long-term economic trends, which CBO projects would occur even if debt did not rise beyond its current level. But greater federal borrowing places additional upward pressure on interest rates and thus on interest costs. Moreover, growth in net interest costs and growth in debt reinforce one another: Rising interest costs would boost deficits and debt, and rising debt would push up interest costs.

Projected Revenues Through 2048

In CBO's extended baseline, revenues are generally projected to constitute a larger share of GDP than they have, on average, in recent decades. Over the past 50 years, revenues as a share of GDP have averaged about 17 percent, but the number has fluctuated between 15 percent and 20 percent of GDP because of changes in tax laws and interactions between those laws and economic conditions.

If current laws generally remained unchanged, revenues would increase as a share of GDP over the coming decade, CBO projects. Revenues would remain near 16.6 percent of GDP through 2021, rise steadily to 17.5 percent by 2025, and then increase sharply in 2026—to 18.1 percent of GDP—following the scheduled expiration of many temporary provisions of the 2017 tax act. By 2028, revenues are projected to total 18.5 percent of GDP.

For years beyond 2028, revenues are projected following the assumption that the rules for all tax sources will evolve as scheduled under current law.[34] Thus, under CBO's extended baseline, revenues would continue to grow faster than GDP beyond 2028 and, two decades later, would total 19.8 percent of GDP. Increases in receipts from individual income taxes account for most of the projected rise of 3.2 percentage points in total revenues as a share of GDP over the next three decades. All told, receipts from all other sources combined are projected to increase slightly as a share of GDP (see Figure 6 on page 15).

The projected increase in total revenues through 2048 reflects structural features of the income tax system, new and expiring tax provisions, demographic trends, changes in the distribution of income, and other factors.

Structural features of the income tax system are the largest contributor to the increase in total revenues (see Table 4). If current laws remained generally unchanged, real bracket creep would continue to gradually push up taxes relative to income over the next three decades, CBO projects. That occurs because most income tax brackets, exemptions, and other tax thresholds are indexed only to inflation. When income grows faster than inflation, as generally happens during economic expansions, tax receipts grow faster than income.[35]

Under current law, some provisions of tax law will expire and others will take effect during the next decade. In total, those changes lead to higher tax revenues in the extended baseline. The most significant change is the expiration, after calendar year 2025, of nearly all provisions in the 2017 tax act that affect individual income taxes. The expiration of those provisions boosts individual income tax receipts relative to GDP by 0.7 percentage points, CBO projects. In addition, a new tax on certain employment-based health insurance plans with high premiums is scheduled to take effect in 2022. Although the revenues raised by that tax would be small initially, rapid growth in health care costs would cause revenues from that tax to rise rapidly over subsequent decades. Also, some rules that allow businesses to accelerate

34. The sole exception to the current-law assumption during the baseline period applies to expiring excise taxes dedicated to trust funds. The Deficit Control Act requires CBO's baseline to reflect the assumption that those taxes would be extended at their current rates. That law does not stipulate that the baseline include the extension of other expiring tax provisions, even if lawmakers have routinely extended them before.

35. The 2017 tax act changed the measure of inflation used to index many parameters of the tax system to an alternative measure that grows more slowly. Consequently, the effect of real bracket creep is slightly greater than CBO projected in prior years.

Table 4.

Reasons for Growth in Total Revenues in CBO's Extended Baseline, 2018 to 2048

Percentage of Gross Domestic Product

Reason for Growth	2018–2028	2029–2048	Total, 2018–2048
Structural Features of the Individual Income Tax[a]	0.5	0.9	1.4
New and Expiring Tax Provisions	0.8	0.4	1.2
Aging and the Taxation of Retirement Income	0.2	0.1	0.3
Changes in the Distribution of Income (Effect on individual income taxes)	0.1	0.1	0.2
Changes in the Distribution of Income (Effect on payroll taxes)	-0.1	-0.1	-0.2
Other Factors	0.4	-0.1	0.3
Total Growth in Revenues Between 2018 and 2048	**1.9**	**1.3**	**3.2**

Source: Congressional Budget Office.

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections through 2028 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

a. Includes real bracket creep, which occurs as more income is pushed into higher tax brackets because people's income rises faster than inflation.

deductions for investment expenses are scheduled to be phased out by the end of December 2027, increasing revenues as a result.

As the population ages, distributions from tax-deferred retirement accounts (including individual retirement accounts, 401(k) plans, and traditional defined benefit pension plans) will tend to grow more rapidly than GDP. Those rising taxable distributions would also boost revenues relative to GDP, mainly between 2018 and 2028, CBO projects.

Earnings are projected to grow faster for higher-income people than for other people over the next 30 years. That trend would cause a larger share of income to be taxed at higher rates under the individual income tax, pushing up revenues relative to GDP by nearly 0.2 percentage points. That increase would be largely offset by a projected decrease of nearly the same amount in payroll tax receipts, as a greater share of earnings would be above the maximum amount subject to Social Security payroll taxes.

As a result of those factors, the effects of the tax system in 2048 would differ substantially from the effects today, both because of the changes in tax rules scheduled under current law and because of structural features in the tax code that gradually push up taxes relative to income. Average taxpayers at every income level would pay more of their income in taxes in 2048 than similar taxpayers do now, primarily because of real bracket creep. Effective marginal federal tax rates also would rise if current laws generally stayed in place, so a larger share of each additional dollar of income that households earned would go to pay taxes (see Table 5). The increase in the marginal tax rate on labor income would reduce people's incentive to work, and the increase in the marginal tax rate on capital income would reduce their incentive to save, thus dampening economic activity, in CBO's estimation.[36] (For a discussion of the long-term economic effects of the 2017 tax act, see Box 1 on page 26.)

Uncertainty of CBO's Long-Term Projections

Even if future tax and spending policies did not vary from those specified in current law, budgetary outcomes would undoubtedly differ from those in CBO's baseline projections because of unexpected changes in the economy, demographics, and other factors. To illustrate the uncertainty of its projections, CBO examined the extent to which federal debt as a percentage of GDP would differ from the amounts in its extended baseline if the agency varied four key factors in its analysis:[37]

- The labor force participation rate,[38]

36. Even though the marginal tax rate on capital income is projected to rise under current law, it would still be lower than in recent years.

37. For additional details about this analytical approach, see Congressional Budget Office, *The 2016 Long-Term Budget Outlook* (July 2016), Chapter 7, www.cbo.gov/publication/51580.

38. The labor force participation rate is the percentage of people in the civilian noninstitutionalized population who are age 16 or older and either working or actively seeking work.

Table 5.

Effective Marginal Federal Tax Rates in CBO's Extended Baseline

Percent

	2018	2028	2048
Marginal Tax Rate on Labor Income	27.2	30.8	32.4
Marginal Tax Rate on Capital Income	14.7	16.5	17.0

Source: Congressional Budget Office.

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections through 2028 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

The effective marginal tax rate on labor income is the share of an additional dollar of such income that is paid in federal individual income taxes and payroll taxes, averaged among taxpayers, with weights proportional to their labor income. The effective marginal tax rate on capital income is the share of the return on an additional dollar of investment made in a particular year that will be paid in taxes over the life of that investment. The before- and after-tax rates of return used to calculate that effective tax rate are weighted averages of the rates for every combination of asset type, industry, form of organization, and source of financing; the weights used are the asset values of each combination.

- The growth rate of total factor productivity,
- Interest rates on federal debt held by the public, and
- Excess cost growth for Medicare and Medicaid spending.

The degree of variation was based on historical movements and on possible future developments. The resulting estimates show that if CBO varied one factor at a time, federal debt held by the public after 30 years would range from 42 percentage points of GDP below the agency's central estimate—152 percent of GDP—to 60 percentage points above it.[39]

If all four factors were varied simultaneously such that projected deficits increased, federal debt held by the public in 2048 would be about 96 percent of GDP above CBO's central estimate.[40] Conversely, if all four factors were varied such that projected deficits decreased, debt after 30 years would be 67 percentage points below the central estimate (see Figure 11).

Those calculations do not cover the full range of possible outcomes, and they do not address other sources of uncertainty in the budget projections, such as the risk of an economic depression or a major war or catastrophe, or the possibility of unexpected changes in rates of birth, immigration, or mortality. Nonetheless, they show that the main implications of this report apply under a wide range of possible values for some key factors that influence federal spending and revenues. In 30 years, if current laws remained generally unchanged, federal debt—which is already high by historical standards—would probably be at least as high as it is today and would most likely be much higher.

Policymakers could take that uncertainty into account in various ways as they make choices for fiscal policy.[41] For example, they might design policies that reduced the budgetary implications of certain unexpected events. Or they might decide to provide a buffer against events with negative budgetary implications by aiming for lower debt than they would in the absence of such uncertainty.

The Size and Timing of Policy Changes Needed to Meet Various Goals for Deficit Reduction

CBO estimated the size of changes in spending or revenues that would be needed if lawmakers wanted to achieve some specific targets for federal debt held by the public. CBO also assessed the extent to which the size of policy adjustments would change if such deficit reduction was delayed, and it examined the effects of waiting to resolve the long-term fiscal imbalance on different generations of the U.S. population.

The Size of Policy Changes Needed to Meet Various Goals for Deficit Reduction

If lawmakers set out to ensure that debt in 2048 matched its current level of 78 percent of GDP, they could achieve

39. CBO's estimates of federal debt with each factor varied individually are presented in the supplemental data accompanying this report at www.cbo.gov/publication/53919.

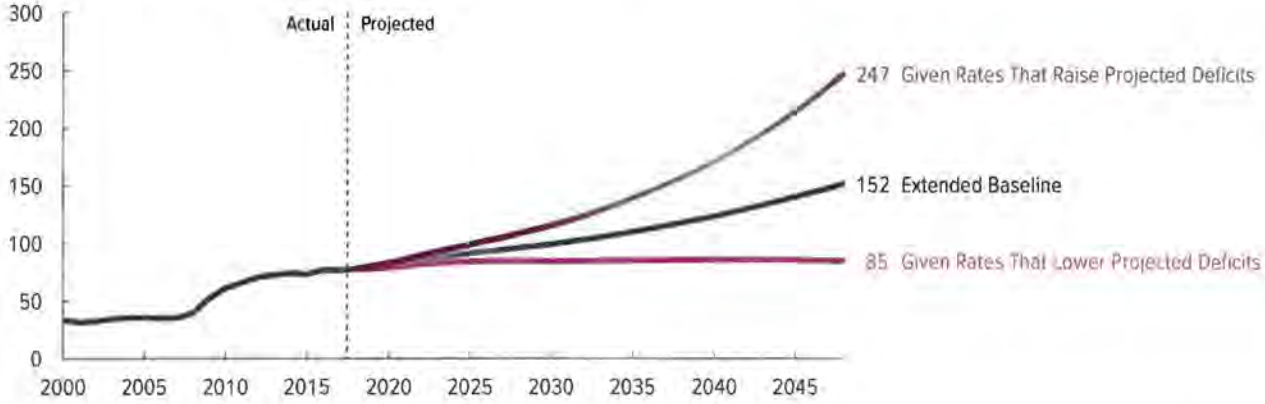
40. When CBO varied all factors simultaneously, it varied each factor by only 60 percent of the amount of variation in each factor individually. The agency used only part of the full range for each of the four factors because the chances of federal debt being above or below the estimates when all four factors are at the high or low ends of their ranges are much smaller than when each individual factor is at the high or low end of its range.

41. See Alan J. Auerbach and Kevin Hassett, "Uncertainty and the Design of Long-Run Fiscal Policy," in Auerbach and Ronald D. Lee, eds., *Demographic Change and Fiscal Policy* (Cambridge University Press, 2001), pp. 73–92, http://tinyurl.com/p93enfp.

Figure 11.

Federal Debt Given Different Rates of Labor Force Participation, Productivity Growth, Federal Borrowing, and Excess Cost Growth for Federal Spending on Medicare and Medicaid

Percentage of Gross Domestic Product



Source: Congressional Budget Office.

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections through 2028 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

Federal debt refers to debt held by the public. Values are CBO's central estimates from ranges determined by alternative assessments of two factors: how much deficits crowd out investment in capital goods, such as factories and computers (because a larger portion of private saving is being used to purchase government securities), and how much people respond to changes in after-tax wages by adjusting the number of hours they work.

The labor force participation rate is the percentage of people in the civilian noninstitutionalized population who are age 16 or older and either working or actively seeking work.

Productivity growth is the growth of total factor productivity—that is, the growth of real (inflation-adjusted) output that is not explained by the growth of labor and capital.

The federal borrowing rate is the interest rate on the federal debt.

Excess cost growth refers to the extent to which the growth rate of nominal health care spending per person—adjusted for demographic characteristics of the relevant populations—exceeds the growth rate of potential gross domestic product per person. (Potential gross domestic product is the maximum sustainable output of the economy.)

For this figure, CBO used values for four factors with a deviation from the extended baseline that was about 60 percent as large as the deviation the agency used when it varied each factor separately. The alternative projections for the four factors begin in 2019.

that result by cutting noninterest spending or raising revenues (or both) in each year beginning in 2019 by amounts totaling 1.9 percent of GDP (see Figure 12 on page 28). (In 2019, 1.9 percent of GDP would be about $400 billion, or $1,200 per person.) If the changes came entirely from revenues or entirely from spending, they would amount, roughly, to an 11 percent increase in revenues or a 10 percent cut in noninterest spending (in comparison with amounts in the extended baseline).

Increases in revenues or cuts in noninterest spending would need to be larger than 1.9 percent of GDP to reduce debt to the percentages of GDP that are more typical of those in recent decades. If lawmakers wanted to lower the debt to 41 percent of GDP (its average over the past 50 years) by 2048, they could achieve that outcome by increasing revenues or cutting noninterest spending (relative to amounts under current law) or by adopting some combination of those two actions beginning in 2019 by amounts totaling 3.0 percent of GDP each year. (In 2019, 3.0 percent of GDP would be about $630 billion, or $1,900 per person.)

If lawmakers wanted to lower debt to its average over the past 50 years by increasing all revenues or by cutting all noninterest spending, the following changes would be necessary:

Box 1.

Effects of the 2017 Tax Act on the Long-Term Budget Outlook

The Congressional Budget Office's extended baseline generally reflects current law, including the economic and budgetary effects of changes to legislation enacted over the past year—notably, the 2017 tax act (Public Law 115-97, originally called the Tax Cuts and Jobs Act). Those long-term projections are consistent with CBO's prior estimates of the 2017 tax act's effects on the U.S. economy—including higher investment, employment, and output—over the 2018–2028 period.[1]

Because various provisions of the 2017 tax act expire by the end of 2026, the economic and budgetary effects of the act as a whole are expected to peak during the early to middle part of the next decade. Beyond 2028, the effects of the major permanent provisions are expected to be modest, although their precise magnitudes are highly uncertain. CBO has not performed a detailed, quantitative analysis of the long-run effects of the 2017 tax act but is able to describe the qualitative effects of its most significant provisions.

Major Provisions of the 2017 Tax Act

The 2017 tax act has temporary and permanent provisions. For the next eight years, the major individual income tax changes are lower rates, a larger standard deduction, limits on the deductibility of mortgage interest and state and local taxes, elimination of personal exemptions, expansion of the child tax credit, changes to the treatment of "pass-through" business income, changes to the individual alternative minimum tax, and increases in the tax exemptions for property transferred at death and for certain gifts. For the next five years, the act allows businesses to immediately deduct the full cost of their investments for eligible equipment and software; that bonus-depreciation provision then phases out over the subsequent five years.

Following the expiration of most of the individual provisions at the end of 2025 and the phaseout of bonus depreciation by the end of 2026, the major permanent provisions of the act that continue are these:

- Lower corporate income taxes (a single rate of 21 percent);
- Higher thresholds for deducting the cost of a tangible asset in the year it is placed in service under section 179 of the tax code;
- Amortization of spending for research and experimentation;
- Limitations on net interest deductions and the use of net operating losses;
- Changes in the inflation adjustments for most tax parameters, including for income tax brackets;
- Elimination of the penalty for not having health insurance; and
- Changes in the taxation of foreign income and measures to reduce profit shifting.

Budgetary Effects Without Macroeconomic Feedback

The 2017 tax act has significant direct effects on CBO's budget projections. Those direct effects do not take into account any changes to the aggregate economy.

Budgetary Effects for 2018 to 2028. Before incorporating macroeconomic feedback, CBO estimated that the tax act would increase the primary deficit (that is, the deficit excluding the costs of servicing the debt) by a cumulative $1.843 trillion from 2018 to 2028 as a result of higher deficits through 2026. Once the temporary provisions have expired and scheduled changes to certain business provisions have taken effect, the permanent provisions are projected to reduce, on net, the primary deficit in 2027 and 2028. Because of the increased deficits, debt-service costs are higher in every year by growing amounts, totaling $471 billion over the period. The total direct effect on the deficit through 2028 would be $2.314 trillion.

Budgetary Effects for 2029 to 2048. After 2028, CBO estimates, the permanent provisions of the act would continue to reduce the primary deficit, on net, over the next 20 years. In particular, the change in the inflation indexing of tax parameters and elimination of the penalty for not having health insurance (which causes fewer people to enroll in health insurance programs subsidized by the federal government) would reduce the deficit by more than the revenues lost through lower corporate taxes.

Economic Effects of the 2017 Tax Act

The largest effects on investment, employment, and output are estimated to occur in the early to middle part of the 2018–2028 period, when both individual and corporate income tax rates are lower and when other temporary provisions and investment incentives (notably, full bonus depreciation) are in place. Most of the tax act's positive effects on the growth of real (inflation-adjusted) gross domestic product (GDP) would occur in the first few years of CBO's projection period. The positive effects on the economy would diminish over the following several years and are expected to be modest after 2028.

Economic Effects for 2018 to 2028. The 2017 tax act would boost the level of real GDP by 0.7 percent, on average, through 2028, with a peak effect of 1.0 percent in 2022. By lowering the corporate income tax rate, the act would give businesses

1. See Congressional Budget Office, *The Budget and Economic Outlook: 2018 to 2028* (April 2018), Appendix B, www.cbo.gov/publication/53651.

Continued

Box 1 Continued

Effects of the 2017 Tax Act on the Long-Term Budget Outlook

incentives to boost investment, and by decreasing individual income tax rates through 2025, it would give people incentives to increase their participation in the labor force and work more hours, expanding the labor supply and employment. Although some provisions of the tax act would deter residential investment, the overall effect on investment is estimated to be positive. However, private investment gains would be partially crowded out by higher federal deficits. Altogether, the largest positive effects on the economy would occur from 2022 to 2024 (before the individual income tax provisions expire at the close of 2025).

The effect of the tax act on real GDP is more modest over the following few years, and by 2028, real GDP would be 0.5 percent higher than it would have been otherwise. Between 2026 and 2028, investment would be boosted by the permanent reduction in the corporate income tax rate. However, the permanent change to amortization of research and experimentation expenses (instead of immediate expensing) would reduce the incentive for that type of investment.

The effects on the supply of labor are projected to be mixed. Marginal personal income tax rates would be higher after 2025 than under prior law because of the change in how various parameters of the tax system, including income tax brackets, are adjusted for inflation. That change would tend to reduce the supply of labor, as more income is pushed into higher tax brackets for a given amount of income growth because the new measure of inflation is expected to rise more slowly than the measure it replaced. In contrast, the permanent elimination of the penalty for not having health insurance would tend to increase the supply of labor, in part because under prior law the penalty rose as household income grew, causing it to act as a tax on income.

From 2026 to 2028, the pattern of the economic effects of the act reflects the transition from all the major provisions of the tax act being in place to only the permanent provisions remaining in effect. As a result, the positive effects on labor, investment, and real GDP would diminish. Nonetheless, those positive effects would be boosted by the reduction in the budget deficit by 2027 that results from the tax act, which makes additional resources available for private investment.

Furthermore, the tax act's international provisions are expected to change the reported location of profits in a way that boosts GDP through 2028, without changing the location of labor or capital. As a result, the provisions are expected to raise total factor productivity slightly over time.

Economic Effects for 2029 to 2048. In CBO's assessment, the various permanent provisions of the act would continue to boost the level of real GDP, on net, for a few years after 2028; over the longer term, the economic effects of the different provisions are expected to be modest, but the net effect is uncertain. The accelerated bracket creep resulting from the change in the indexing of tax parameters for inflation and the permanent change to amortization of research and experimentation expenses would tend to lower output by modestly reducing the supply of labor and capital, respectively. Elimination of the penalty for not having health insurance is expected to partially offset the negative effect on labor, and the permanent reduction in the corporate income tax rate and lower federal deficits would tend to increase output modestly by boosting investment.

The tax act's international provisions are expected to increase GDP slightly over the long term, although their overall economic effects are uncertain. Those effects would depend on how companies adjusted their international business structures and transactions and how foreign governments changed their tax rules in response.

Overall, the net impact on output would depend on the balance of all those effects. Individually and collectively, the effects become increasingly uncertain over the last 20 years of the projection period.

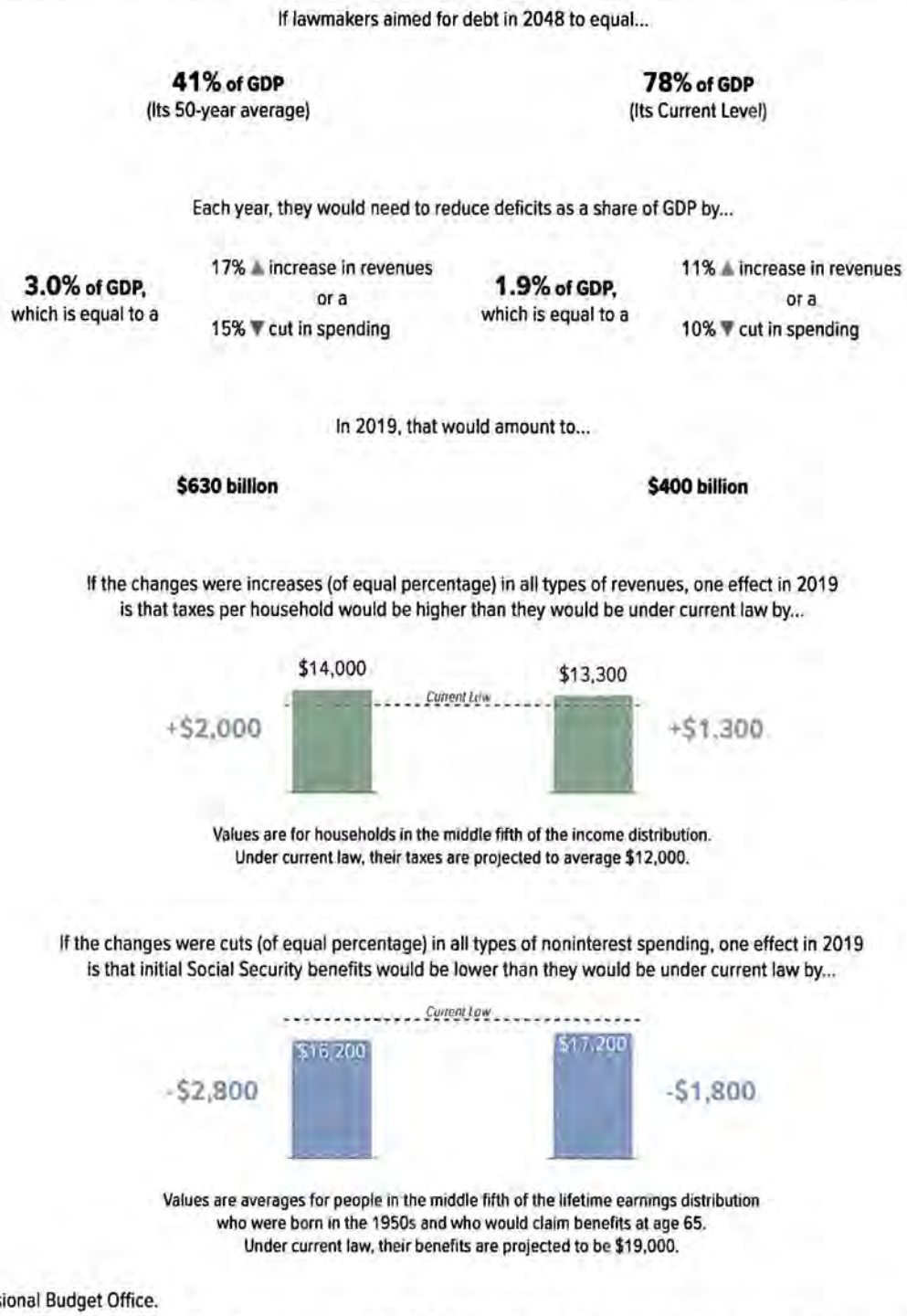
Budgetary Effects With Macroeconomic Feedback

CBO estimates that macroeconomic feedback from the tax act—that is, the ways in which the act would affect the budget by changing the overall economy—would subtract a total of $571 billion from primary deficits over the 2018–2028 period. That reduction would mainly result from the act's boost to taxable income, which would increase revenues. With that macroeconomic feedback incorporated, CBO projects that the act would increase primary deficits by $1.272 trillion through 2028. Incorporating the act's effects on debt-service costs from changes in federal borrowing and changes in interest rates would push the deficit to an estimated $1.854 trillion over the 2018–2028 period.

The net effects of the tax act on real GDP and other economic variables are expected to be modest after 2028 but the magnitudes are uncertain (in part because a number of factors tend to offset each other). As a result, the macroeconomic feedback to federal spending and revenues is also expected to be small but uncertain in those years. Despite that uncertainty, the overall effects of the permanent provisions of the act, including their macroeconomic feedback, are projected to reduce the primary deficit somewhat from 2029 to 2048.

Figure 12.

The Size of Policy Changes Needed to Make Federal Debt Meet Two Possible Goals in 2048



Source: Congressional Budget Office.

In this figure, the indicated sizes of the policy changes are relative to CBO's extended baseline, which generally reflects current law, following CBO's 10-year baseline budget projections through 2028 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period. The projected effects of the policy changes on debt include the direct effects of the policy changes and the feedback to the federal budget that would be attributable to faster economic growth. The effects on growth and the feedback to the federal budget reflect the positive economic effects of lowering the debt but do not reflect any assumptions about the specific details of the policy changes.

GDP = gross domestic product; n.a. = not applicable.

- If collections of the various types of revenues were increased proportionally, total revenues would need to rise by about 17 percent each year over the 2019–2048 period. On average, that adjustment would result in federal taxes that were about $2,000 higher than they are under current law for households in the middle fifth of the income distribution in 2019.

- If all types of noninterest spending were cut by an equal percentage, spending overall would need to decrease by about 15 percent in each of the next 30 years. For example, such cuts would lower initial annual Social Security benefits by about $2,800, on average, for people in the middle fifth of the lifetime earnings distribution who were born in the 1950s and who first claimed benefits at age 65.

In all of those examples, the projected effects on debt include both the direct effects of the policy changes and the feedback to the federal budget that would result from faster economic growth. Those economic effects reflect the reduction in debt but do not reflect any assumptions about the specific details of the policy changes. For example, such changes could alter productivity growth and people's incentives to work and save, which would then affect overall economic output and have macroeconomic feedback effects on the federal budget.

The Timing of Policy Changes Needed to Meet Various Goals for Deficit Reduction

The size of the policy changes that would be needed to achieve a particular goal for federal debt would depend, in part, on how quickly that goal was expected to be reached. Regardless of the chosen goal for federal debt, lawmakers would face trade-offs in deciding how quickly to implement policies designed to put federal debt on a sustainable path. The benefits of reducing the deficit sooner would include a smaller accumulated debt, smaller policy changes required to achieve long-term outcomes, and less uncertainty about the policies lawmakers would adopt. However, if lawmakers implemented spending cuts or tax increases too quickly, people might have insufficient time to plan for or adjust to the new system.

Over the next few years, such policy changes would dampen overall demand for goods and services, thus decreasing output and employment relative to CBO's projections under current law. However, that dampening effect would be temporary, CBO expects, because of the response of prices and interest rates to the reductions in demand and to the resulting actions by the Federal Reserve. Those responses to changing demand would be stronger over the next few years than they would be if the economy was weaker.

By contrast, if policymakers waited several years to reduce federal spending or increase taxes, more debt would accumulate over the long term, which would slow long-term growth in output and income. Thus, reaching any chosen target for debt would require larger changes. Nonetheless, if policymakers waited several years to enact deficit-reduction policies, the economy probably would be affected less over the short term than would be the case if immediate changes were made.

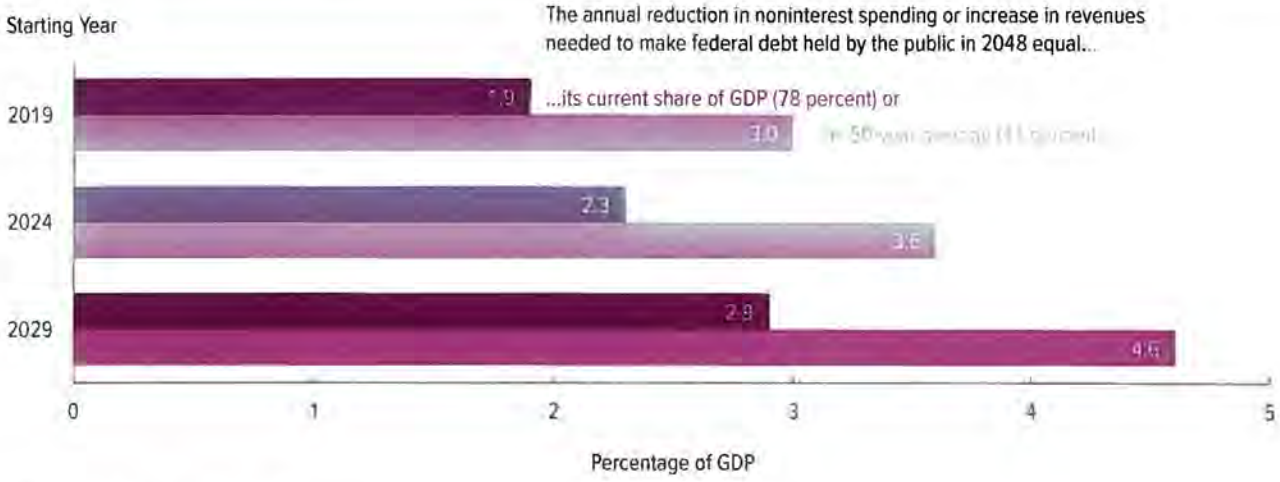
Faster or slower implementation of policies to reduce budget deficits would tend to impose different burdens on different generations. Reducing deficits sooner would probably require older workers and retirees to sacrifice more but would benefit younger workers and future generations. Reducing deficits later would require smaller sacrifices from older people but greater ones from younger workers and future generations.

CBO has analyzed those trade-offs in two ways. First, it estimated the extent to which the size of policy adjustments would change if deficit reduction was delayed. For example, if lawmakers sought to reduce debt as a share of GDP to its historical 50-year average of 41 percent in 2048 and if the necessary policy changes did not take effect until 2024, the annual deficit reduction would need to amount to 3.6 percent of GDP rather than the 3.0 percent that would accomplish the same goal if the changes were made in 2019 (see Figure 13). If lawmakers chose to wait another five years to implement the policies (having them take effect in 2029 instead), even larger changes would be necessary; the required annual deficit reduction in that case would amount to 4.6 percent of GDP.

Second, CBO studied the effects on various generations from waiting to resolve the long-term fiscal imbalance. In 2010, CBO compared economic outcomes under two policies. One would stabilize the debt-to-GDP ratio starting in a particular year; the other would wait

Figure 13.

How Timing Affects the Size of Policy Changes Needed to Make Federal Debt Meet Two Possible Goals in 2048



Source: Congressional Budget Office.

GDP = gross domestic product.

10 years to do so.[42] That analysis suggested that people in generations born after the earlier implementation date would be worse off under the second option. However, people born more than 25 years before the earlier implementation date would be better off if action was delayed—largely because they would partly or entirely avoid the policy changes needed to stabilize the debt. Generations born between those two groups could either gain or lose from delayed action, depending on the details of the policy changes.[43]

Even if lawmakers waited several years to implement policy changes to reduce deficits in the long term, making decisions about them sooner would offer two main advantages. First, people would have more time to prepare. Second, policy changes that reduced the debt would hold down longer-term interest rates and could lessen uncertainty—thus enhancing businesses' and consumers' confidence. Those factors would boost output and employment in the near term.

Changes From Last Year's Long-Term Budget Outlook

Compared with last year's projections of federal debt, those presented in this report are higher through 2041 and slightly lower thereafter. Most of the increases in debt through 2041 stem from larger projected deficits through 2025 that arise from tax and spending legislation enacted since last March: the 2017 tax act, the Bipartisan Budget Act of 2018, and the Consolidated Appropriations Act, 2018. After 2025, deficits are smaller as a share of GDP than CBO projected last year because of lower projected noninterest spending and similar or higher projected revenues. Those lower deficits ultimately result in lower projected debt as a share of GDP. (Appendix A describes the differences in demographic and economic projections between last year's report and this year's, and Appendix B describes key revisions to the budgetary projections since last year that are summarized in this section.)

42. See Congressional Budget Office, *Economic Impacts of Waiting to Resolve the Long-Term Budget Imbalance* (December 2010), www.cbo.gov/publication/21959. That analysis was based on a projection of slower growth in debt than CBO now projects, so the estimated effects of a similar policy today would be close, but not identical, to the effects estimated in that analysis. For a different approach to analyzing the costs of debt reduction for different generations, see Felix Reichling and Shinichi Nishiyama, *The Costs to Different Generations of Policies That Close the Fiscal Gap*, Working Paper 2015-10 (Congressional Budget Office, December 2015), www.cbo.gov/publication/51097.

43. Those conclusions do not incorporate the possible negative effects of a fiscal crisis or effects that might arise from the government's reduced flexibility to respond to unexpected challenges.

As a percentage of GDP, noninterest spending is generally lower than the amount projected last year. That slowdown is driven by lower projected spending as a share of GDP for Social Security, the major health care programs, and other mandatory spending. Those declines are partially offset by increases in discretionary spending. Revenues are lower as a share of GDP through 2026, largely unchanged for most of the next two decades, and slightly higher by 2048. Those changes reflect provisions of the 2017 tax act.

Under the extended baseline, CBO projects that debt would reach 148 percent of GDP in 2047, which is lower than the amount the agency projected last year. Projected deficits as a share of GDP in this year's report are larger from 2018 through 2025 and smaller thereafter than those in last year's report. The budgetary changes needed to make federal debt 30 years from now equal either today's level or the 50-year historical average (as a share of GDP) are similar to the changes CBO projected would be required in last year's report.

The 75-year actuarial deficit currently projected for Social Security is 1.5 percent of GDP (the same amount that CBO estimated last year) or 4.4 percent of taxable payroll (slightly smaller than last year's estimate of 4.5 percent). The projected actuarial deficit declined since last year because CBO boosted its projection of the share of earnings that are subject to Social Security payroll taxes over the next 30 years and because CBO projects slightly smaller benefits relative to GDP and taxable payroll and, over the next two decades, higher interest rates. Offsetting those changes is an adjustment to the 75-year period of analysis, which ends in 2092 in this report and thus includes an additional year of deficits.

APPENDIX

A

CBO's Projections of Demographic and Economic Trends

The Congressional Budget Office's assessment of the long-term outlook for the federal budget is based on projections over the next three decades of trends in a host of demographic and economic variables. Through 2028, the economic and demographic projections presented in this report are the same as those that CBO published in April.[1] For the years beyond 2028, CBO's projections generally reflect historical trends and anticipated demographic changes. (Average values for 2018 to 2048, the period encompassed by CBO's extended baseline, as well as for shorter periods, are shown in Table A-1.[2] The table also provides historical data for comparison. A set of annual projections is included in this report's supplemental data, available online at www.cbo.gov/publication/53919.)

Demographic Variables

Both the size and composition of the U.S. population influence the overall growth of the economy and affect federal tax revenues and spending. Rates of fertility, immigration, and mortality determine the population and thus the size of the labor force and the number of people receiving benefits from federal programs such as Social Security and Medicare. CBO projects the population to be about the same in the future as it projected last year.

Population

In CBO's projections, the total population increases from 332 million at the beginning of 2018 to 392 million in 2048, and its annual growth rate gradually declines from 0.7 percent in 2018 to 0.4 percent in 2048. The population is projected not only to grow more slowly but also to become older, on average, than in the past. In the agency's projections, over the 30-year period, the share of the population that is 65 or older grows, whereas the share that is of working age (defined as those between ages 20 and 64) shrinks. As a result, CBO projects, a growing portion of the population will receive benefits from the Social Security and Medicare programs while a shrinking portion will pay into the trust funds that support them.

Fertility

CBO projects a total fertility rate of 1.9 children per woman for the 2018–2048 period.[3] (That rate, which represents the average number of children that a woman would have in her lifetime, is calculated as the sum of fertility rates for all ages between 15 and 49 in a given year.)[4] The total fertility rate for the 1988–2007 period averaged 2.0 children per woman. Fertility rates often decline during recessions and rebound during recoveries. However, the U.S. fertility rate did not recover after the 2007–2009 recession; the rate (which was 2.1 in 2007) dropped and has remained below 1.9.[5] CBO's projected rate is consistent with the rate recommended to the Social Security Advisory Board by its 2015 Technical Panel on Assumptions and Methods, the board's most recent panel.[6]

1. See Congressional Budget Office, *The Budget and Economic Outlook: 2018 to 2028* (April 2018), www.cbo.gov/publication/53651.

2. The extended baseline generally reflects current law, following CBO's 10-year baseline projections through 2028 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

3. In CBO's long-term model, the likelihood that a particular woman will have a child depends on such factors as that woman's education, marital status, immigration status, and childbearing history.

4. The total fertility rate can also be defined as the average number of children that a woman would have in her lifetime if, in each year of her life, she experienced the birth rates observed or assumed for that year and if she survived her entire childbearing period.

5. Recent data show that total fertility rates have remained below 1.9. See Brady E. Hamilton and others, *Births: Provisional Data for 2017*, Vital Statistics Rapid Release Report 4 (National Center for Health Statistics, May 2018), www.cdc.gov/nchs/nvss/vsrr/reports.htm.

6. See 2015 Technical Panel on Assumptions and Methods, *Report to the Social Security Advisory Board* (September 2015), p. 9, https://go.usa.gov/cJYR5 (PDF, 3.4 MB).

Table A-1.

Average Annual Values for Demographic and Economic Variables That Underlie CBO's Extended Baseline

	1988–2017	2018–2028	2029–2038	2039–2048	Overall, 2018–2048
			Demographic Variables		
Growth of the Population (Percent)	0.9	0.7	0.5	0.4	0.6
Fertility Rate (Children per woman)	2.0	1.9	1.9	1.9	1.9
Immigration Rate (Per 1,000 people in the U.S. population)	3.7	3.1	3.2	3.2	3.2
Life Expectancy at Birth, End of Period (Years)[a]	79.1	80.5	81.7	82.8	82.8
Life Expectancy at Age 65, End of Period (Years)[a]	19.4	20.2	20.9	21.7	21.7
			Economic Variables (Percent)		
Growth of GDP					
Real GDP	2.5	1.9	1.9	1.9	1.9
Nominal GDP (Fiscal Year)	4.7	4.1	4.0	4.0	4.0
Growth of the Labor Force	1.0	0.5	0.4	0.4	0.4
Labor Force Participation Rate	65.6	62.1	60.3	59.6	60.7
Unemployment					
Unemployment rate	5.9	4.4	4.8	4.7	4.6
Natural rate of unemployment	5.1	4.6	4.5	4.5	4.5
Growth of Average Hours Worked	-0.1	*	-0.1	-0.1	*
Growth of Total Hours Worked	1.0	0.5	0.3	0.4	0.4
Earnings as a Share of Compensation	81	81	81	81	81
Growth of Real Earnings per Worker	0.9	1.5	1.2	1.1	1.2
Share of Earnings Below the Taxable Maximum	85	81	81	80	81
Growth of Productivity					
Total factor productivity	1.2	1.1	1.2	1.2	1.2
Labor productivity[b]	1.5	1.4	1.6	1.6	1.5
Inflation					
Growth of the CPI-U	2.6	2.4	2.4	2.4	2.4
Growth of the GDP price index	2.1	2.1	2.0	2.0	2.0
Interest Rates					
Real rates					
On 10-year Treasury notes and Social Security bonds	2.3	1.4	1.6	2.1	1.7
Nominal rates					
On 10-year Treasury notes and Social Security bonds	4.9	3.8	4.0	4.5	4.1
On all federal debt held by the public[c]	5.0	3.1	3.6	4.1	3.6

Source: Congressional Budget Office.

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections through 2028 and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

CPI-U = consumer price index for all urban consumers; GDP = gross domestic product; * = between -0.05 percent and 0.05 percent.

a. Life expectancy as used here is period life expectancy, which is the amount of time that a person in a given year would expect to survive beyond his or her current age on the basis of that year's mortality rates for various ages.

b. The measure of labor productivity reported here is the ratio of real output to hours worked in the economy. Note that elsewhere CBO reports different measures of labor productivity, such as the ratio of potential real output to the potential labor force.

c. The interest rate on all federal debt held by the public equals net interest payments in the current fiscal year divided by debt held by the public at the end of the previous fiscal year.

Immigration

Under current law, CBO projects, net immigration to the United States (a measure that accounts for all people who either enter or leave the United States in any year) would grow by an average of 0.7 percent per year over the next decade. Thereafter, net immigration is projected to grow more slowly, at a rate of 0.6 percent per year. On the basis of those projections, CBO expects net annual immigration to rise from 1.1 million people in 2018 to 1.3 million people in 2048. Expressed another way, the rate of net annual immigration per thousand people in the U.S. population would rise from an average of 3.1 over the next decade to 3.2 in 2048.

CBO's projection of net immigration over the next decade is informed by the agency's economic projections and by recent demographic trends, both of which have particularly important implications for projections of net unauthorized immigration. CBO's projections of unauthorized immigration are the result of two offsetting effects, to which the agency gave equal weight in its analysis. On the one hand, in CBO's estimation, periods of moderate growth in the U.S. economy over the past two decades have been associated with increases in unauthorized immigration; consequently, CBO's projections of economic growth suggest growth in such immigration over the coming decade. On the other hand, although unauthorized immigration is very difficult to measure, historical estimates indicate that the number of unauthorized immigrants in the United States in 2015 was about the same as in 2005. The implication is that factors other than the strength of the economy have been more important recently and may continue to be in the future.[7]

CBO projects that the increase in net immigration over the next decade would be mostly driven by increases in the number of legal permanent residents. The annual increase in the number of legal temporary and unauthorized immigrants is projected to be relatively steady over the next 10 years.

For projections beyond the next decade, CBO employed a simplified approach: After 2028, under current law, the agency projects that net immigration would grow at an average rate of 0.6 percent annually, slightly faster than the overall average rate of population growth.[8]

Mortality

The mortality rate, which is the number of deaths per thousand people, has generally declined in the United States for at least the past half century. For the most part, the mortality rate has dropped more quickly for younger people than for older people during that period. Mortality rates for each five-year age group are projected to decline at the same average pace each group experienced from 1950 through 2014. After projecting average mortality rates for men and women in each age group, CBO incorporates differences in those rates on the basis of marital status, education, disability insurance status, and lifetime household earnings. CBO projects lower mortality rates and thus longer life expectancies for people who are married, have more education, do not receive benefits through the Social Security Disability Insurance (DI) program, or are in higher-income groups.[9] (For people under 30, the mortality projections account for age and sex only.)

CBO's projections result in an average life expectancy at birth of 82.8 years in 2048, compared with 79.2 years in 2018.[10] Similarly, CBO projects life expectancy at age

7. For the most recent estimates, see Jens Manuel Krogstad, Jeffrey S. Passel, and D'Vera Cohn, *As Mexican Share Declined, U.S. Unauthorized Immigrant Population Fell in 2015 Below Recession Level* (Pew Research Center, April 2017), https://tinyurl.com/mn5zbb5. For more details, see Jeffrey S. Passel and D'Vera Cohn, *Overall Number of U.S. Unauthorized Immigrants Holds Steady Since 2009* (Pew Research Center, September 2016), https://tinyurl.com/j45zw05. Official data on unauthorized immigrants do not exist, so historical estimates are very uncertain.

8. That rate is based on the Census Bureau's projections for late in the coming decade. See Census Bureau, "2014 National Population Projections: Summary Tables," Table 1, https://go.usa.gov/xQGwc. The Census Bureau has recently released a new set of projections, but information from those projections has not been incorporated in this analysis. In those projections, the population is slightly smaller than the Census Bureau projected in 2014.

9. For more information about mortality differences among groups with different earnings, see Tiffany Bosley, Michael Morris, and Karen Glenn, *Mortality by Career-Average Earnings Level*, Actuarial Study 124 (Social Security Administration, April 2018), https://tinyurl.com/yct5qdew (PDF, 301KB); Congressional Budget Office, *Growing Disparities in Life Expectancy* (April 2008), www.cbo.gov/publication/41681; and Julian P. Cristia, *The Empirical Relationship Between Lifetime Earnings and Mortality*, Working Paper 2007–11 (Congressional Budget Office, August 2007), www.cbo.gov/publication/19096.

10. Life expectancy as used here is period life expectancy, which is the amount of time that a person in a given year would expect to survive beyond his or her current age on the basis of that year's mortality rates for various ages.

65 to be 21.7 years in 2048, or 2.2 years longer than life expectancy at age 65 in 2018.[11]

Changes in Demographic Projections Since Last Year
CBO's projections of population growth in most years are very similar to those published in last year's report, except for small changes to CBO's projections of net immigration and mortality rates. Net immigration was projected to grow, on average, more quickly in the decade following 2017 in last year's report than it is projected to grow in the decade following 2018 in this year's report. That is because last year's projections included growth in 2017 that was higher than in the rest of the 10-year period. The average growth in net immigration over the decade following 2018 in this year's report does not include that year of higher growth.

The life expectancies CBO now projects are only slightly different from those reported last year. Life expectancy at birth is projected to be 82.7 years in 2047, 0.1 year shorter than CBO projected last year, and life expectancy at age 65 is projected to be 21.6 years, 0.1 year longer than in last year's projection. Those changes reflect recent data that show higher mortality rates than CBO expected last year for people ages 15 to 74 and lower mortality rates than expected last year for people 75 or older. Those data led CBO to increase its projection of mortality rates for people ages 15 to 74 in the near term and to reduce their rates of mortality improvement over the next three decades, which reduced CBO's projection of life expectancy at birth. In contrast, for people 75 or older, CBO decreased its projection of mortality rates and increased the rate of mortality improvement, which increased CBO's projection of life expectancy at age 65 throughout the 30-year period.

Economic Variables

The performance of the U.S. economy in coming decades will affect the federal government's tax revenues, spending, and debt accumulation. In CBO's analysis, the long-term effects depend on key economic variables such as the growth of gross domestic product (GDP), the size and composition of the labor force, the number of hours worked, earnings per worker, capital accumulation, and productivity. Over the short term, the effects also depend on variables that fluctuate over the business cycle, such as inflation and interest rates. The agency also considers ways in which fiscal policy influences economic activity.

Gross Domestic Product
CBO expects total output in the economy to grow moderately over the 2018–2048 period. In the agency's projections, real GDP growth over that period averages 1.9 percent per year, about what was projected last year for the 2017–2047 period. However, the pattern of that growth is different in this year's projections; CBO now projects that real GDP grows faster over the next few years. As a result, the level of real GDP remains higher over the projection period.

Projections of GDP. CBO anticipates that recent changes to the tax code, changes in discretionary spending, and continuing increases in aggregate demand will spur a pickup in the growth of real GDP over the next few years (see Box 1 on page 26 for details on the effects of the recent changes to the tax code).[12] Thereafter, growth in real GDP is projected to make a transition to a pace that reflects the increases in the supply of labor, capital services, and productivity described below. That projected pace also takes into consideration the influences of the marginal tax rates and increases in federal debt that CBO projects in its extended baseline.[13]

Over the long term, total GDP is projected to be one-half of one percent below its potential (maximum sustainable) amount, as it has roughly been, on average, over past decades. Those projected outcomes reflect CBO's assessment that, during and after economic downturns, actual output has fallen short of potential output to a greater extent and for longer periods than actual output has exceeded potential output during economic booms.[14]

11. CBO projects life expectancy in 2090 to be 86.9 years at birth and 24.4 years at age 65. CBO's projections of life expectancies are longer than those of the Social Security trustees (85.8 and 23.5 years, respectively) but shorter than the projections (88.3 and 25.3 years, respectively) recommended by the 2015 Technical Panel on Assumptions and Methods in *Report to the Social Security Advisory Board* (September 2015), pp. 13–20, https://go.usa.gov/cJYR5 (PDF, 3.4 MB).

12. Aggregate demand is total purchases by consumers, businesses, government, and foreigners of a country's output of final goods and services during a given period.

13. The marginal tax rate is the percentage of an additional dollar of income from labor or capital that is paid in taxes.

14. See Congressional Budget Office, *Why CBO Projects That Actual Output Will Be Below Potential Output on Average* (February 2015), www.cbo.gov/publication/49890.

Projected real GDP growth over the next three decades is slower than the average annual rate of 2.5 percent recorded over the past three decades, primarily because the labor force is anticipated to grow more slowly in the coming years. Moreover, with the labor force growing more slowly than the overall population, per capita real GDP is expected to increase at a slower pace than it has in the past—at an average annual rate of 1.4 percent over the 2018–2048 period, compared with 1.6 percent for the past 30 years.

Changes in Projections of GDP Since Last Year. In CBO's current projections, the level of real GDP is about 1.4 percent higher in 2027 than the agency projected last year. That gap shrinks over the next two decades; by 2047 real GDP is 0.7 percent higher than it was last year. The higher level of real GDP in this year's projections stems primarily from three factors: revisions to historical data, changes in federal fiscal policy, and improvements in analytical methods.

The Rate of Labor Force Participation

The size of the labor force is determined by the size of the population and the rate at which people participate in the labor market. CBO has slightly raised its projection of the labor force participation rate since last year.

Projections of the Labor Force Participation Rate. In CBO's projections, the rate of labor force participation—that is, the share of the civilian noninstitutionalized population age 16 or older that is either working or seeking work—declines from 62.8 percent in 2018 to 61.0 percent in 2028 and to 59.5 percent in 2048. The aging of the population is the most important factor driving down the overall participation rate over the next 30 years; the effects of other factors roughly offset one another.

Because older people tend to participate in the labor force at lower rates than younger people, the aging of the population is expected to significantly dampen the rate of participation over the next 30 years. The share of people over the age of 65 is projected to increase from 16 percent in 2018 to 22 percent in 2048, and the share of the population ages 20 to 64 is expected to decline from 59 percent to 55 percent during that 30-year period. Without the effects of an aging population—that is, if the age-and-sex composition of the population remained the same as it is expected to be in 2018—the labor force participation rate would stay roughly constant over the next 30 years, in CBO's judgment.[15]

The effects of several other trends and fiscal policies roughly offset one another. Three trends put downward pressure on the participation rate:

- Men of the generations that followed the baby boomers tend to participate in the labor force at lower rates than male baby boomers did at the same age. (The participation of women from generations following the baby boomers has remained relatively constant.)
- The share of people receiving DI benefits is generally projected to continue to rise, and people who receive such benefits are less likely to work.
- The marriage rate is projected to continue to fall, especially among men, and unmarried men tend to participate in the labor force at lower rates than married men.

CBO expects those forces to be mostly offset by two trends. As the population becomes more educated, labor participation rates are expected to increase because workers with more education tend to participate in the labor force at higher rates than do people with less education. Second, increasing longevity is expected to lead people to continue working to increasingly older ages.[16]

In addition to the effects of those demographic trends, recent changes in tax law, combined with economic and budgetary trends, would also affect the labor force:

- CBO estimates that, under current law, lower tax rates on labor would increase participation in the labor force over most of the next decade because individuals would see a greater return on their labor. However, the lower tax rates are scheduled to expire

15. That calculation includes an adjustment for age and sex, but the sex composition of the population is projected to change only slightly. Therefore, the decline in the labor force participation rate is attributable almost entirely to aging.

16. The agency recently updated its methods for projecting labor force participation to more adequately account for recent trends in educational attainment and aging. See Josh Montes, *CBO's Projection of Labor Force Participation Rates*, Working Paper 2018-04 (Congressional Budget Office, March 2018), www.cbo.gov/publication/53616.

at the end of 2025, reducing the incentive to work, which would in turn reduce participation in the labor force toward the end of the decade.

- In addition, major tax legislation enacted in 2017 adopted an alternative measure of inflation for the tax code that grows slightly more slowly than the inflation measure used previously. Tax brackets, which are set to increase with inflation, will increase more slowly because of this new measure. Consequently, real income growth in the future will cause an increased share of labor income to be pushed into higher tax brackets. Over time, under an assumption that current laws remain unchanged, that bracket creep would reduce incentives to work.

- Rising federal deficits are projected to slow growth in the stock of private capital and limit the growth of after-tax wages, also reducing the supply of labor. However, recent changes to the tax code provide greater incentives to invest, mitigating some of the effects of higher deficits on the stock of private capital.

Changes in Projections of the Labor Force Participation Rate Since Last Year. CBO's current projections of the labor force participation rate through 2025 are higher than its projections last year because of the enactment of individual tax provisions that raise after-tax wages during the next several years. Last year, CBO projected the participation rate would be 61.3 percent by 2025. This year, CBO projects the participation rate to be 61.7 percent in 2025.

Beyond 2025, participation rates over the next three decades are slightly higher than the rates published last year. Last year, the participation rates were projected to be 61.0 percent in 2027 and 59.3 percent in 2047. In the current projections, those rates are 61.2 percent and 59.5 percent, respectively.

When combined with CBO's projections of the population, the projected rates of labor force participation imply that the labor force grows by 0.4 percent per year, on average, over the 2018–2048 period. That rate is slightly less than the 0.5 percent per year projected a year ago.

Other Labor Market Outcomes

Among the factors accounted for in CBO's labor market projections—in addition to the size of the population and the rate of labor force participation—are the unemployment rate, the average and total number of hours that people work, and various measures of workers' earnings. The agency has changed its projections of those variables over the past year because of updates to historical data and reexamination of recent trends.

Unemployment. In CBO's projections, the unemployment rate, which was 4.1 percent at the end of 2017, declines to 3.3 percent in 2019, gradually rises to 4.8 percent by 2024, and then remains at that level, on average, through 2028. In the meantime, the natural rate of unemployment (the rate that results from all sources other than fluctuations in overall demand related to the business cycle) is projected to remain at 4.6 percent from 2018 to 2028. From 2024 onward, the unemployment rate is expected to remain about one-quarter of one percentage point above the natural rate, a difference that is consistent both with the historical average relationship between the two measures and with the projected gap of one-half of one percent between actual and potential GDP.

After 2028, both the actual and the natural rates of unemployment are projected to decline gradually as the labor force ages and becomes increasingly more educated. (Older and more educated workers tend to have lower actual and natural rates of unemployment.) By 2048, the natural rate of unemployment is projected to be slightly less than 4.4 percent, and the actual rate is projected to be about 4.7 percent.

Average Hours Worked. Different subgroups of the labor force work different numbers of hours, on average. Men tend to work more hours than women do, for example, and people between the ages of 30 and 40 tend to work more hours than people between the ages of 50 and 60. In CBO's estimation, those differences among groups will remain stable. However, over the long term, the composition of the labor force is projected to shift toward groups that tend to work less (such as older workers). As a result, the average number of hours worked by the labor force as a whole is expected to decline slightly. By 2048, the average number of hours that people work is expected to be about 1 percent less than it is today.

Total Hours Worked. On the basis of projections of the size of the labor force, average hours worked, and unemployment, total hours worked are estimated to increase at an average annual rate of 0.4 percent between 2018 and 2048.

Earnings as a Share of Compensation. Workers' total compensation consists of taxable earnings and nontaxable benefits such as employers' contributions to health insurance and pensions. Over the years, the share of total compensation paid in the form of earnings has declined—from about 90 percent in 1960 to about 81 percent in 2017—mainly because the cost of health insurance has risen more quickly than total compensation.[17]

CBO expects that trend in health care costs to continue, which would further decrease the proportion of compensation that workers receive as earnings. However, under current law, a new excise tax on certain employment-based health insurance plans that have premiums above specified amounts is scheduled to take effect in 2022. Some employers and workers are expected to respond by shifting to less expensive plans, thereby reducing the share of compensation consisting of health insurance premiums and increasing the share that consists of earnings. In CBO's projections, the effects of the tax on the mix of compensation roughly offset the effects of rising costs for health care until the effects of rising costs outweigh those of the excise tax late in the projection period. As a result, the share of compensation that workers receive as earnings is projected to remain close to 81 percent through most of the 2018–2048 period.

Growth of Real Earnings per Worker. Projections of prices, nonwage compensation (such as employment-based health insurance), average hours worked, and labor productivity (discussed below) imply that real earnings per worker grow by an average of 1.2 percent annually over the 2018–2048 period. That rate is higher than the average annual growth—0.9 percent—of real earnings per worker over the last 30 years.

Distribution of Earnings. Over the past several decades, earnings have grown faster for higher earners than for lower earners. In CBO's projections, the unequal growth in earnings continues for the next three decades. The distribution of earnings affects revenues from income taxes and payroll taxes, among other things. Income taxes are affected by the earnings distribution because of the progressive rate structure of the income tax; people with lower earnings pay a smaller share of their earnings than people with higher earnings.

Social Security payroll taxes are also affected by the earnings distribution. Those taxes are levied only on earnings up to a certain annual amount ($128,400 in 2018). Below that amount, earnings are taxed at a combined rate of 12.4 percent, split between the employer and employee (self-employed workers pay the full amount); no tax is paid on earnings above the cap. The taxable maximum has remained a nearly constant proportion of the average wage since the mid-1980s, but because earnings have grown more for higher earners than for others, the portion of covered earnings on which Social Security payroll taxes are paid has fallen from 90 percent in 1983 to 83 percent in 2016.[18] The portion of earnings subject to Social Security taxes is projected to fall to about 81 percent by 2028 and to fall below 80 percent by 2048.

Changes in Projections of Other Labor Market Outcomes Since Last Year. Projections of most other labor market outcomes are similar to what CBO projected last year. For example, CBO's long-term projection of the natural rate of unemployment is only slightly lower than its projection a year ago because of updates to historical data and trends.

An important change since last year in the labor market outcomes discussed in this section is to the projected distribution of earnings. Data for the past few years show smaller-than-expected increases in the share of wages and salaries received by higher earners. In response, the agency made a downward revision to projected increases in that share over the next decade. As a result, in this year's projections, households with lower individual income tax rates earn a larger share of total income than CBO projected last year, and total income tax revenues are lower than would otherwise be the case.

Additionally, with a smaller share of wages and salaries received by higher earners, a larger share is received by

17. For more details, see Congressional Budget Office, *How CBO Projects Income* (July 2013), www.cbo.gov/publication/44433.

18. Covered earnings are those received by workers in jobs subject to Social Security payroll taxes. Most workers pay payroll taxes on their earnings, although a small number—mostly in state and local government jobs or in the clergy—are exempt.

people whose annual earnings are below the maximum amount subject to Social Security payroll taxes. Thus, the share of earnings below the taxable maximum is expected to decline more slowly than CBO projected last year. In last year's projections, the share of earnings below the taxable maximum declined until 2027 and then remained at roughly that level through the end of the projection period. In this year's projections, the share of earnings below the taxable maximum declines gradually through 2048. By 2027 that share is 1.4 percentage points higher than in last year's projections, and declines to roughly the same level in 2047 as CBO projected last year. Over the 30-year period, that share is about half of a percentage point higher, on average, than CBO estimated last year.

Capital Accumulation and Productivity

In addition to growth in the labor force and the number of hours worked, two other important factors affect the growth in output. One is the accumulation of capital, including physical structures, equipment, land, and inventories used in production, along with intangible capital such as computer software. The accumulated stock contributes a stream of services to production. The second is the growth of total factor productivity (TFP), which is the growth of real output per unit of combined labor and capital services—that is, the growth of output that is not explained by the growth of labor and capital. Combined, the growth rates projected for the labor supply, the capital stock, and TFP result in a projection of the average growth of labor productivity (output per worker).

Capital Services. Over the longer term, in CBO's view, growth in the nation's stock of capital will be driven by private saving, federal borrowing, and international flows of financial capital. Private saving and international capital flows tend to move with the after-tax rate of return on investment, which measures the extent to which investment in the stock of capital results in a flow of income. That rate is affected both by tax rates and by the growth of TFP. Recent reductions in statutory tax rates on corporations permanently increase incentives to invest in capital and consequently raise the level of capital services.

Total Factor Productivity. The annual growth of TFP is projected to increase from about 0.9 percent in 2018 to about 1.2 percent in 2022 and then to remain at that rate through 2048, yielding an average annual growth rate of roughly 1.2 percent from 2018 to 2048. That projected growth rate is about 0.3 percentage points slower than the average annual rate of 1.5 percent observed since 1950 and slightly slower than the average rate recorded since 1990.

The projected path for TFP reflects several considerations that, in CBO's judgment, suggest slower growth in coming decades than the long-term historical average. For example, with the exception of a period of rapid growth in the late 1990s and early 2000s, productivity has tended to grow more slowly in recent decades than it did during the 1950s and 1960s. The long-term trend suggests that projections for the next few decades should place greater weight on more recent, slower growth than on the relatively rapid growth of the more distant past. Thus, although CBO projects an acceleration of TFP growth from its unusually slow recent rate, the agency anticipates it to return to a rate that is slower than its long-term historical average.

A number of developments support slow-growth projections for TFP. One is the anticipated slowing of growth in labor quality, a measure of workers' skills that accounts for educational attainment and work experience that, in CBO's analysis, is implicitly a part of TFP. Following a relatively rapid rise during the 1980s and 1990s, growth in labor quality slowed after 2000. In CBO's judgment, that change results both from a gradual slowdown in the increase in average educational attainment and from the burgeoning retirement of a relatively large and skilled portion of the workforce—the baby-boom generation. In coming decades, however, the slowdown in the growth of labor quality is expected to be partly offset by the aging of those remaining in the labor force, especially as better health and longer life expectancy lead people to stay in the workforce longer than did members of previous generations. (An older workforce generally has a larger proportion of more highly educated workers because they tend to remain in the labor force longer than do workers with less education.) Nevertheless, CBO anticipates slower growth in labor quality than in the past.

Another factor that is projected to slow the growth of TFP relative to its long-term average is the projected reduction in spending for federal investment. Under the assumptions used for CBO's baseline, the government's nondefense discretionary spending is projected to decline over the next decade to a much smaller percentage of GDP than it has averaged in the past. About half of nondefense discretionary spending from the 1980s onward has consisted of federal investment in physical

capital (such as roads and other infrastructure), education and training, and research and development—all of which, in CBO's judgment, contributed to TFP growth. Consequently, lower nondefense discretionary spending as a percentage of GDP would mean less federal investment, causing TFP to grow more slowly.

In contrast, changes to the tax code are projected to raise productivity by discouraging multinational corporations' profit-shifting strategies that historically have reduced official estimates of TFP. Because TFP is a component of GDP, CBO projects an increase in GDP as tax incentives encourage firms to claim as domestic production the services of intellectual property that were previously claimed as production abroad. CBO has slightly increased its projections of TFP to account for this anticipated increase in output, which is not matched by an increase in production inputs.

Labor Productivity. Taken together, the projections of labor supply, capital services, and TFP result in labor productivity that is expected to grow by 1.5 percent annually over the 2018–2048 period.[19]

Changes in Projections of Capital Accumulation and Productivity Since Last Year. CBO projects roughly the same average TFP growth that it projected last year. However, CBO's projection of capital services is above the level it projected last year, largely because of stronger investment incentives in the tax code that cause businesses to raise investment.

Inflation

CBO projects rates of inflation for two categories: prices of consumer goods and services and prices of final goods and services in the economy.[20] Those rates influence nominal (current year) levels of income and interest rates and thereby influence tax revenues, various types of federal expenditures that are indexed for inflation, and interest payments on federal debt.

Prices of Consumer Goods and Services. One measure of consumer price inflation is the annual rate of change in the consumer price index for all urban consumers (CPI-U). Over the 2018–2048 period, inflation in that measure averages 2.4 percent in CBO's projections. That long-term rate is slightly less than the average rate of inflation since 1990 of 2.5 percent per year. CBO projects that, under a chained measure of inflation, prices grow at a rate 0.25 percent less than the annual increase in the consumer price index.[21]

Prices of Final Goods and Services. After 2018, the annual inflation rate for all final goods and services produced in the economy, as measured by the rate of increase in the GDP price index, is projected to average 0.4 percentage points less than the annual increase in the consumer price indexes. The GDP price index grows more slowly than the consumer price indexes because it is based on the prices of a different set of goods and services and a different method of calculation.

Changes in Projections of Inflation Since Last Year. Inflation in both measures of consumer prices is projected to be roughly the same as the rates CBO projected last year for the 2017–2047 period.

Interest Rates

CBO projects the interest rates, both real and nominal, that apply to federal borrowing, including the rate on 10-year Treasury notes and special-issue Social Security bonds. It also projects the average nominal interest rates on federal debt held by the public and on the bonds held in the Social Security trust funds. Those rates influence the cost of the government's debt burden and the evolution of the trust funds.

After considering a number of factors, including slower growth of the labor force, CBO expects real interest rates on federal borrowing to be lower in the future than they have been, on average, over the past few decades. The

19. The measure of labor productivity reported here is the ratio of real output to hours worked in the economy. Note that elsewhere CBO reports different measures of labor productivity, such as the ratio of potential real output to the potential labor force.

20. Final goods and services are those purchased directly by consumers, businesses (for investment), and governments, as well as net exports.

21. The chained CPI-U tends to grow more slowly than the standard CPI-U because it uses a formula that better accounts for households' tendency to substitute similar goods and services for each other when relative prices change and because, unlike the CPI-U, it is little affected by statistical bias related to the sample sizes that the Bureau of Labor Statistics uses in computing each index. Historically, inflation as measured by the chained CPI-U has been 0.25 percentage points lower, on average, than inflation as measured by the CPI-U. CBO's projections reflect that average difference between the two measures.

real interest rate on 10-year Treasury notes (calculated by subtracting the rate of increase in the consumer price index from the nominal yield on those notes) averaged roughly 2.9 percent between 1990 and 2007.[22] That rate has averaged 1.0 percent since 2009 and is projected to be 1.4 percent in 2028. In CBO's projections, the rate continues to rise thereafter, reaching 2.4 percent in 2048, 0.5 percentage points below its average over the 1990–2007 period. CBO's projections of interest rates this year are higher than last year's.

Factors Affecting Interest Rates. Interest rates are determined by a number of factors. CBO projects the rates by comparing how the values of those factors are expected to differ in the long term relative to their average values in the past. However, conclusions from such analyses depend greatly on the period being considered, as some recent decades show: Real interest rates were low in the 1970s because of an unexpected surge in inflation. In the 1980s, when inflation declined at an unexpectedly rapid pace, real rates were high.[23] Interest rates fell sharply during the financial crisis and recession that began in 2007.

To avoid using any of those possibly less representative periods, CBO considered average interest rates and their determinants over the 1990–2007 period and then judged how different those determinants might be over the long term.[24] That period was chosen for comparison because it featured fairly stable expectations of inflation and no severe economic downturns or significant financial crises.

Some factors reduce interest rates; others increase them. In CBO's estimates for the 2018–2048 period, several factors tend to reduce interest rates on government securities relative to their 1990–2007 average:

- The labor force is projected to grow much more slowly than it did from 1990 to 2007. That slower growth in the number of workers would tend to increase the amount of capital per worker in the long term, reducing the return on capital and, therefore, also reducing the return on government bonds and other investments.[25]

- The share of total income received by higher-income households is expected to be larger in the future than during the 1990–2007 period. Higher-income households tend to save a greater proportion of their income, so the difference in the distribution of income is projected to increase the total amount of saving available for investment, other things being equal. As a consequence, the amount of capital per worker is projected to rise and interest rates are expected to be lower.

- TFP is projected to grow more slowly in the future than it did from 1990 to 2007. For a given rate of investment, lower productivity growth reduces the return on capital and results in lower interest rates, all else being equal.

- CBO expects investors' preferences for Treasury securities relative to riskier assets to remain elevated compared with inclinations over the 1990–2007 period. Investors began to have less appetite for risk

22. Between 1970 and 2007, the real interest rate on 10-year Treasury notes averaged 2.8 percent; the average from 1954 to 2007 was 2.6 percent. Historical inflation rates are taken from the consumer price index, adjusted to account for changes over time in the way that the index measures inflation. See Bureau of Labor Statistics, "CPI Research Series Using Current Methods (CPI-U-RS)" (March 28, 2018), www.bls.gov/cpi/cpiurs.htm.

23. CBO calculates real interest rates by subtracting expected rates of inflation from nominal interest rates. In general, borrowers and lenders agree to nominal interest rates after accounting for their expectations of what inflation will be. However, if inflation ends up being higher than was expected when the rates were agreed to, real interest rates will turn out to be lower than anticipated. If inflation ends up lower than expected, the opposite will occur. CBO uses the actual consumer price index, adjusted to account for changes over time in the way that the index measures inflation, as a proxy for both what expectations of inflation have been in the past and what they will be in the future. One drawback is that if inflation fluctuates rapidly over time, changes in expectations may lag behind changes in actual inflation. Although CBO's approach could mismeasure expectations of inflation and real interest rates in some years, the way inflation has varied over time suggests that CBO's approach is a useful proxy over long periods, on average.

24. A Bank of England study identified a similar set of determinants that account for the decline in real interest rates over the past 30 years. See Rachel Lukasz and Thomas D. Smith, *Secular Drivers of the Global Real Interest Rate*, Staff Working Paper 571 (Bank of England, December 2015), https://tinyurl.com/z6zqnb7 (PDF, 1.8 MB).

25. For more information about the relationship between the growth of the labor force and interest rates, see Congressional Budget Office, *How Slower Growth in the Labor Force Could Affect the Return on Capital* (October 2009), www.cbo.gov/publication/41325.

in the early 2000s, and the demand for low-risk assets was strengthened by the economic fallout from the financial crisis, the slow subsequent recovery, and financial institutions' response to increased regulatory oversight. Moreover, in the past several years, the perception that investments in emerging market economies were riskier than investments in the United States probably contributed to the increased demand for U.S. assets (particularly federal debt) that are considered to be relatively risk-free. The rise in demand for Treasury securities from those sources contributed to lower returns (that is, to lower interest rates). CBO expects preferences for Treasury securities relative to riskier assets to gradually decline over the next three decades but to remain above their average levels from 1990 to 2007.

At the same time, in CBO's estimates, several factors tend to boost interest rates on government securities relative to their average over the 1990–2007 period:

- Under CBO's extended baseline, federal debt is projected to be much larger as a percentage of GDP than it was before 2007—reaching 96 percent by 2028 and 152 percent by 2048. The latter figure is more than three and a half times the average over the 1990–2007 period. Greater federal borrowing tends to crowd out private investment in the long term, reducing the amount of capital per worker and increasing both interest rates and the return on capital over time.

- CBO anticipates that emerging market economies will attract a greater share of foreign investment in coming decades than they did in the 1990–2007 period. As economic and financial conditions in those economies continue to improve, they will become increasingly attractive destinations for foreign investment. CBO projects that development to put upward pressure on interest rates in the United States.

- The capital share of income—the percentage of total income that is paid to owners of capital—has been on an upward trend for the past few decades. The share is projected to decline over the next decade from its current, elevated level but remain higher than its average over recent decades. The factors that appear to have contributed to the rise in income for owners of capital (such as technological change and globalization) are likely to persist, keeping it above the historical average. In CBO's estimation, a larger share of income accruing to owners of capital would directly boost the return on capital and, thus, interest rates.

- The retirement of members of the baby-boom generation and slower growth of the labor force will reduce the number of workers in their prime saving years relative to the number of older people who are drawing down their savings, CBO projects. As a result, in CBO's estimates, the total amount of saving available for investment decreases (all else being equal), which tends to reduce the amount of capital per worker and thereby push up interest rates. (CBO estimates that this effect only partially offsets the positive effect of increased income inequality on saving, leaving a net increase in savings available for investment.)

Some factors mentioned above are easier than others to quantify. For instance, the effect of labor force growth and rising federal debt can be estimated from available data, theoretical models, and estimates in the literature. The extent to which other factors will affect interest rates is more difficult to estimate. A shift in preferences for low- rather than high-risk assets is not directly observable, for example. And although the distribution of income is observable, neither models nor empirical estimates offer much guidance for quantifying its effect on interest rates.

In light of those sources of uncertainty, CBO relies not only on economic models and findings from the research literature but also on information from financial markets to guide its assessments of the effects of various factors on interest rates over the long term. The current rate on 30-year Treasury bonds, for example, reflects market participants' judgments about the path that interest rates on short-term securities will take 30 years into the future. That market forecast informs CBO's assessment of market expectations for the risk premium—the premium paid to investors for the extra risk associated with holding longer-term bonds—and for investment opportunities in the United States and abroad, and it points to considerably lower interest rates well into the future than those of recent decades.

Projections of Interest Rates. CBO anticipates considerable movement in long-term interest rates over the first 11 years of the projection. For the next few years, CBO

projects interest rates to rise as GDP expands beyond its potential and the Federal Reserve tightens monetary policy. Beginning in late 2021, CBO expects long-term interest rates to decline as GDP growth slows and the economy moves back towards its historical relationship with potential output. Beginning in 2024, long-term interest rates in CBO's projections gradually rise in response to increases in the ratio of debt to GDP.

The nominal interest rate on 10-year Treasury notes is projected to average 4.1 percent over the 2018–2048 period and to reach 4.8 percent in 2048. The real interest rate on 10-year Treasury notes is projected to average about 1.7 percent and, at the end of the period, to be 2.4 percent.

The average interest rate on all federal debt held by the public tends to be lower than the rates on 10-year Treasury notes because interest rates are generally lower on shorter-term debt than on longer-term debt and because Treasury securities are expected to mature, on average, over periods of less than 10 years.[26] CBO projects a 0.4 percentage-point difference between the rate on 10-year Treasury notes and the effective rate on federal debt over the 2029–2048 period. That difference is projected to average 0.6 percentage points over the next decade. The difference is larger over the coming decade than for later years because a significant portion of federal debt that will be outstanding during the next 10 years was issued at the very low interest rates prevailing in the aftermath of the 2007–2009 recession. (The average interest rate on all federal debt changes more slowly than the 10-year rate because only a portion of federal debt matures each year.) Thus, in CBO's projections, the average nominal interest rate on all federal debt held by the public is about 3.6 percent for the 2018–2048 period and reaches 4.4 percent in 2048.

The Social Security trust funds hold special-issue bonds that generally earn interest at rates that are higher than the average rate on federal debt. In CBO's projections, the nominal interest rate on bonds newly issued to the trust funds averages 4.1 percent over the 2018–2048 period and reaches 4.8 percent in 2048. The corresponding real rates are 1.7 percent, on average, over the full period and 2.4 percent in 2048.

Because interest rates have been low for much of the past decade, CBO projects the average interest rate earned by all bonds held (both new and previously issued) by the Social Security trust funds to be slightly lower than the interest rate on newly issued bonds over the next decade. The average interest rate on all bonds, which CBO uses to calculate the present value of future streams of revenues and outlays for those funds, is projected to average 3.8 percent for the 2018–2048 period.[27]

Changes in Projections of Interest Rates Since Last Year. CBO's projections of interest rates this year are higher than last year's. The real rates on 10-year Treasury notes and the Social Security bonds are projected to average 1.7 percent over the 2018–2048 period and to be 2.3 percent in 2047. Last year, CBO projected both rates would average 1.5 percent over the 2017–2047 period and would be 2.3 percent in 2047.

The path of interest rates is higher in this year's projections than in last year's. Long-term interest rates are poised to end the first half of 2018 roughly half a percentage point higher than CBO projected last year. The higher rate probably reflects the expectation of tighter monetary policy (in response to a stronger labor market and greater inflationary pressure) as well as reduced demand for long-term Treasury bonds. Both trends are expected to continue over the next several years. In addition, CBO projects greater federal borrowing to push up interest rates. The upward revision to 10-year Treasury rates is anticipated to peak at 1 percentage point in 2020. The upward revision is predicted to be smaller in later years, as economic growth returns to its historical relationship with potential output growth and downward revisions to projected deficits gradually reduce the upward revision to the stock of debt. From 2023 to 2047, the 10-year Treasury rate is roughly unchanged in this year's report compared to last year's projection.

26. In particular, from 2018 to 2028, the difference between the rate on 3-month Treasury bills and the rate on 10-year Treasury notes shrinks from 1.2 percentage points to its longer-run level of 1 percentage point.

27. A present value is a single number that expresses a flow of past and future income or payments in terms of an equivalent lump sum received or paid at a specific time. The value depends on the rate of interest, known as the discount rate, that is used to translate past and future cash flows into current dollars at that time.

APPENDIX

B

Changes in Long-Term Budget Projections Since March 2017

The 30-year projections of federal spending and revenues presented in this report differ from the projections that the Congressional Budget Office published in 2017 because of certain changes in law, revisions to some of the agency's assumptions and methods, the availability of more recent data, and changes to the agency's projections of demographic and economic variables.[1] For the same reasons, CBO's 10-year projections have also changed since 2017, and they serve as the foundation for the 30-year projections. The 10-year projections are typically published in *The Budget and Economic Outlook*; however, since the publication of that report in April, the agency has adjusted them.[2] As a result, the long-term projections in this report are based on those adjusted projections (see Table B-1).

This appendix compares CBO's current long-term budget projections with those published last year. Because most of the projections in the 2017 report ended in 2047, the appendix compares projections only through that year.

Measured as a percentage of gross domestic product (GDP), federal debt held by the public is now projected to be higher through 2041, and lower thereafter, than CBO projected last year. Under the extended baseline, debt is projected to grow from about 78 percent of GDP this year to 148 percent in 2047; last year, CBO projected that it would rise from 77 percent of GDP in 2018 to 150 percent in 2047 (see Figure B-1).[3] The revised projections of debt resulted from changes in both spending and revenue projections, all of them presented here as a percentage of GDP:

- Projected noninterest spending is lower than CBO anticipated last year, though the difference shrinks toward the end of the 30-year projection period. The main cause is downward revisions to outlays for Social Security and the major health care programs in CBO's projections, though those reductions in mandatory spending are partially offset by increases in discretionary spending.[4]

- Net spending for interest is projected to be higher through the late 2030s than it was in last year's projections and lower thereafter. The initial difference results from higher projected interest rates and greater projected levels of debt held by the public than CBO projected last year. That relationship reverses later in the projection period as deficits become smaller than projected a year ago, a change that leads to lower interest costs and slower accumulation of debt.

- Projected revenues are lower through 2026 than they were in last year's projections, similar for most of the following two decades, and then slightly higher by the end of the 30-year projection period. Those changes reflect provisions of Public Law 115-97, which is referred to here as the 2017 tax act.

1. See Congressional Budget Office, *The 2017 Long-Term Budget Outlook* (March 2017), www.cbo.gov/publication/52480. The changes in demographic and economic projections are described in Appendix A of this report.

2. In total, the adjustments reduced the projected deficit for 2018 by $12 billion and reduced projected deficits over the 2019–2028 period by a cumulative $17 billion. For the April report, see Congressional Budget Office, *The Budget and Economic Outlook: 2018 to 2028* (April 2018), www.cbo.gov/publication/53651. For the adjusted projections, see Congressional Budget Office, *An Analysis of the President's 2019 Budget* (May 2018), www.cbo.gov/publication/53884.

3. The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

4. Mandatory spending is generally governed by provisions of permanent law, whereas discretionary spending is controlled by annual appropriation acts.

Table B-1.

Comparison of CBO's Adjusted April 2018 Baseline and January 2017 Baseline

Billions of Dollars

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Adjusted April 2018 Baseline											
Revenues	3,339	3,490	3,680	3,829	4,016	4,232	4,448	4,667	5,003	5,301	5,520
Outlays	4,131	4,463	4,683	4,947	5,290	5,505	5,693	6,020	6,324	6,616	7,047
Deficit	-793	-973	-1,003	-1,118	-1,275	-1,273	-1,245	-1,352	-1,321	-1,314	-1,527
Debt Held by the Public at the End of the Year[a]	15,676	16,743	17,804	18,970	20,290	21,609	22,904	24,310	25,687	27,058	28,642
January 2017 Baseline											
Revenues	3,604	3,733	3,878	4,019	4,176	4,346	4,527	4,724	4,931	5,140	n.a.
Outlays	4,091	4,334	4,562	4,816	5,135	5,346	5,554	5,890	6,228	6,548	n.a.
Deficit	-487	-601	-684	-797	-959	-1,000	-1,027	-1,165	-1,297	-1,408	n.a.
Debt Held by the Public at the End of the Year[a]	15,416	16,092	16,845	17,704	18,721	19,776	20,858	22,078	23,430	24,893	n.a.
Difference Between Adjusted April 2018 Baseline and January 2017 Baseline											
Revenues	-265	-243	-199	-190	-160	-114	-79	-57	72	161	n.a.
Outlays	40	129	121	132	155	158	139	130	96	68	n.a.
Deficit[b]	-305	-372	-320	-322	-315	-272	-217	-187	-24	93	n.a.
Debt Held by the Public at the End of the Year[a]	260	650	959	1,266	1,569	1,832	2,046	2,232	2,257	2,165	n.a.

Sources: Congressional Budget Office; staff of the Joint Committee on Taxation.

n.a. = not applicable.

a. The net amount that the Treasury borrows is determined primarily by the annual budget deficit. In addition, several factors—collectively labeled "other means of financing" and not directly included in budget totals—also affect the government's need to borrow from the public.

b. Negative numbers indicate that CBO's projection of the deficit has grown.

Over most of the coming decade, the decrease relative to last year's projections, measured as a share of GDP, is larger for revenues than for noninterest spending (see Figure B-2). The result is that projected deficits through 2025 are now markedly larger than previously projected. Beginning in 2026, however, they are smaller than previously projected.

Changes in Projected Spending

In CBO's extended baseline, noninterest spending as a percentage of GDP is slightly lower than anticipated last year, mainly because the agency's projections of outlays for Social Security and the major health care programs have fallen. CBO's projections of discretionary spending, by contrast, are higher than they were a year ago. Projections of net interest costs are higher than previously projected through the late 2030s and then lower.

Noninterest Spending

As a share of GDP, noninterest spending—that is, spending for Social Security, spending for the major federal health care programs, and other noninterest spending—is projected to be about the same in 2018 as projected last year and lower thereafter. Specifically, it is projected to equal 19.0 percent of GDP in 2018 and to reach 23.0 percent of GDP by 2047 (0.2 percentage points lower than in last year's projection).

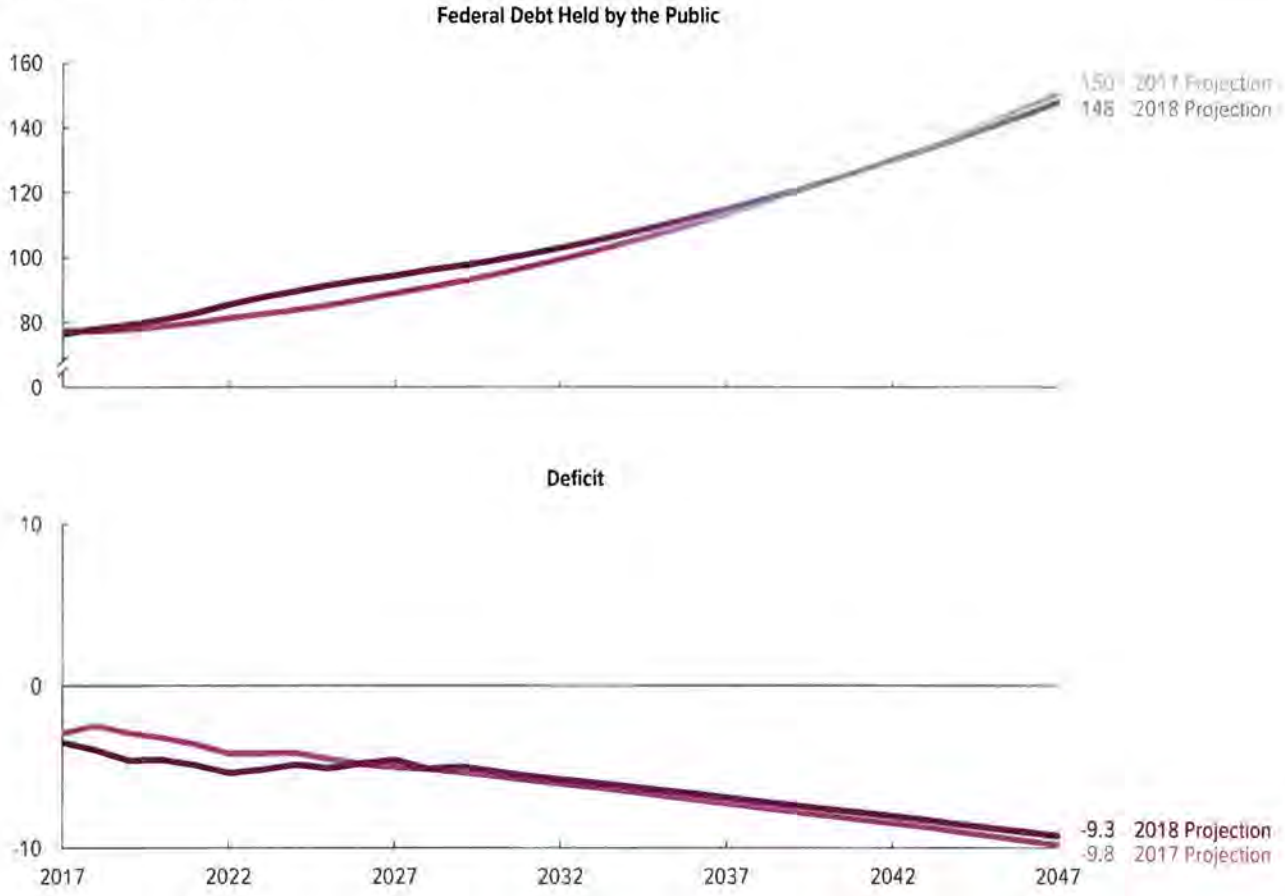
Social Security Spending. CBO projects that outlays for Social Security as a percentage of GDP will be slightly lower than the agency anticipated last year. That change reflects slightly lower projections of nominal outlays over the next 10 years and higher projections of GDP.

The revisions to nominal outlays over the next 10 years include a downward adjustment of projected spending

Figure B-1.

Comparison of CBO's 2017 and 2018 Projections of Federal Debt Held by the Public and the Deficit in the Extended Baseline

Percentage of Gross Domestic Product



Source: Congressional Budget Office.

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

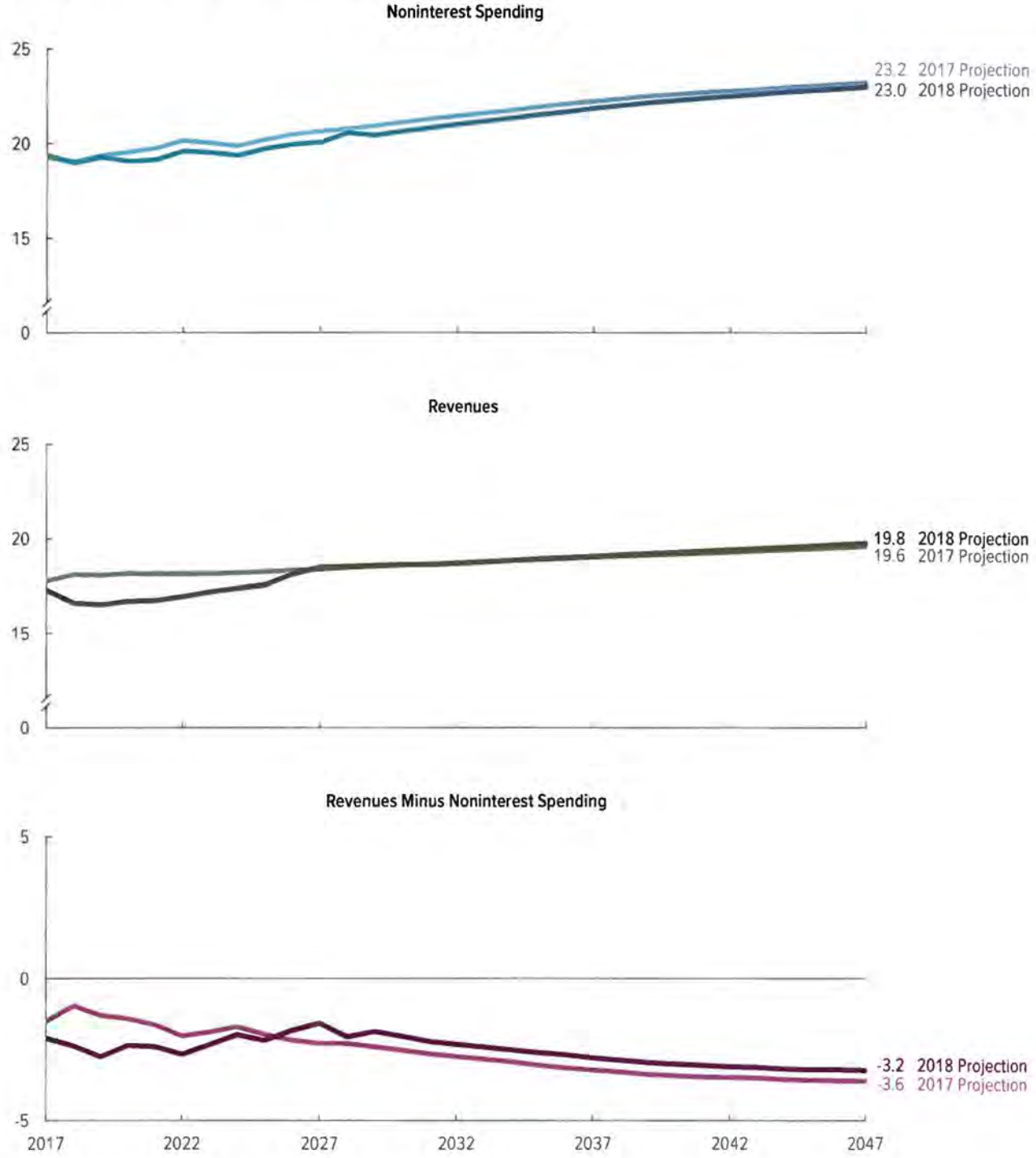
on Disability Insurance (DI), which is a component of the Social Security program, and lower projections of average wage rates through 2020. The DI projections are lower mainly because caseloads have been lower than anticipated over the past year, which led CBO to reduce its projection of the number of DI beneficiaries initially as well as projections of growth in the number of beneficiaries over the next several years. The projections of average wage rates are lower because of downward revisions to historical data. (Lower projections of average wage rates reduce projected spending on Social Security benefits because the earnings on which initial benefits are based are indexed to growth in average wages. When that growth is lower, the resulting benefits are also lower.)

Major Federal Health Care Spending. CBO's current long-term projection of federal spending for the major health care programs, measured as a percentage of GDP, is lower than last year's projection. Spending for Medicare net of offsetting receipts (that is, premiums paid by beneficiaries) is now projected to equal 2.9 percent of GDP in 2018 (0.1 percent of GDP lower than projected last year) and then to rise steadily to 5.8 percent of GDP in 2047 (0.3 percent of GDP

Figure B-2.

Comparison of CBO's 2017 and 2018 Projections of Spending and Revenues in the Extended Baseline

Percentage of Gross Domestic Product



Source: Congressional Budget Office.

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

lower than projected last year). That reduction occurred mostly because CBO has increased its projections of GDP. Outlays for Medicaid and the Children's Health Insurance Program (CHIP), combined with spending to subsidize health insurance purchased through the marketplaces established under the Affordable Care Act and related spending, are projected to be lower than previously anticipated through the late 2030s and higher thereafter, totaling 3.3 percent of GDP in 2047, slightly larger than the sum projected last year. That larger ultimate amount results from faster growth of Medicaid spending in the second and third decades than projected a year ago.

To project long-term spending for the major health care programs, CBO used the same method that it used last year. Namely, it combined estimates of the number of people who are projected to receive benefits from those programs with fairly mechanical estimates of the growth of spending per beneficiary (adjusted to account for demographic changes to the beneficiaries in each program). CBO has estimated such growth by combining projected growth in potential GDP per person with projected excess cost growth for each program.[5] (From 2018 to 2027, potential GDP per person is projected to grow at an average rate of about 3.4 percent per year, up from the 3.1 percent estimated last year; from 2018 to 2047, the average growth rate is projected to be about 3.4 percent per year, roughly the same as last year's estimate.)

For each category of spending except CHIP, through 2028, CBO used the rate of excess cost growth implicit in the agency's 10-year baseline projections.[6] For 2029, the rate equals the average rate from 2024 to 2028 (the last 5 years of the 10-year baseline projections). The rates of excess cost growth for Medicare, Medicaid, and private health insurance therefore all differ in 2029. After 2029, the rate for each category moves linearly, by the same fraction of a percentage point each year, from that category-specific rate to a rate of 1.0 percent in 2048.[7]

For Medicare, the average annual rate of excess cost growth implicit in CBO's baseline projections is about 1.0 percent from 2019 through 2028, slightly lower than last year's average of 1.1 percent from 2018 through 2027. The rate of excess cost growth for 2029 is 1.2 percent, the same as last year's estimate. Excess cost growth is projected to average 1.1 percent over the full projection period, the same as last year's estimate but lower than the historical average of 1.3 percent from 1985 to 2016.

For Medicaid, the average annual rate of excess cost growth implicit in CBO's baseline projections for the federal share of such spending is 1.5 percent from 2019 through 2028, up by 0.3 percentage points from last year's estimate for 2018 through 2027. The rate for 2029 is 1.6 percent, up by 0.9 percentage points from last year's estimate. That change was the cumulative result of many updates that CBO made to its baseline projections for legislative, economic, and technical reasons—with the largest contribution resulting from an update to CBO's methods that made the agency's estimates of growth in costs per beneficiary more consistent throughout the 10-year projection period. The rate of excess cost growth is projected to average 1.4 percent over the full projection period, which is 0.4 percentage points higher than last year's estimate and 0.4 percentage points higher than the 1985–2016 average.

For private health insurance premiums, which CBO uses as an input to its calculation of marketplace subsidies, the average annual rate of excess cost growth implicit in CBO's baseline projections is about 2 percent from 2019 through 2028 (the same as last year's estimate). The rate for 2029 is also about 2 percent, which again is similar to last year's estimate. The rate is projected to decline from 2029 to 2048 and to be lower in 2048 than its historical average.

Other Noninterest Spending. Over the next 10 years, other noninterest spending—total federal spending on everything other than Social Security, the major federal health care programs, and net interest—is projected to be slightly higher as a percentage of GDP than projected last year and roughly the same thereafter. For most of the next 10 years, the part of that spending that is mandatory is slightly lower than previously projected as a share of GDP because CBO has revised its projections of GDP upward. But that decline is more than offset

5. Potential GDP is the maximum sustainable output of the economy. Excess cost growth is the extent to which health care costs per person, after being adjusted for demographic changes, grow faster than potential GDP per person.

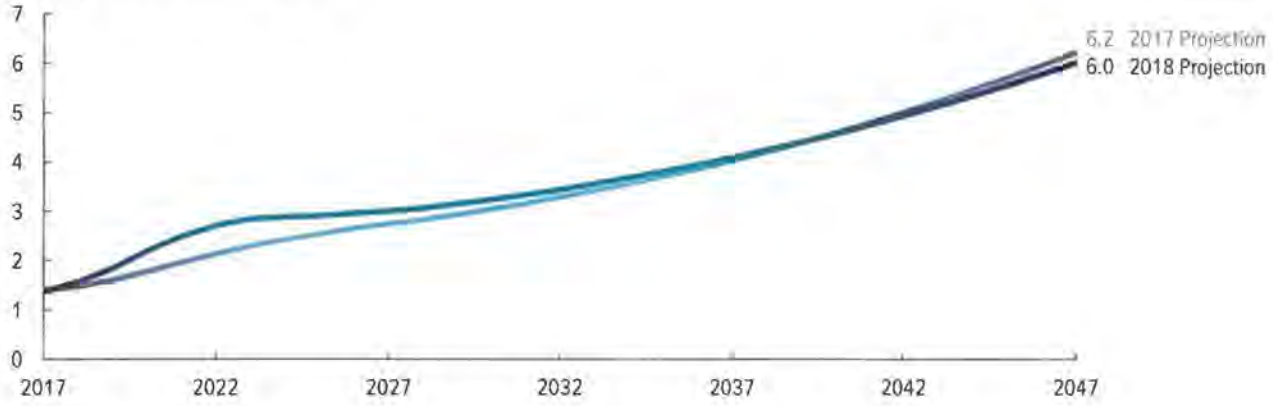
6. Spending for CHIP is projected differently. Outlays for CHIP are projected to be a constant percentage of GDP after 2028.

7. For more information, see Congressional Budget Office, *The 2016 Long-Term Budget Outlook* (July 2016), Chapter 3, www.cbo.gov/publication/51580.

Figure B-3.

Comparison of CBO's 2017 and 2018 Projections of Net Spending for Interest in the Extended Baseline

Percentage of Gross Domestic Product



Source: Congressional Budget Office.

The extended baseline generally reflects current law, following CBO's 10-year baseline budget projections and then extending most of the concepts underlying those baseline projections for the rest of the long-term projection period.

by an increase in projected discretionary spending. That increase stems primarily from legislative changes that increased funding for defense and nondefense spending limited by caps on annual appropriations and that increased funding for emergency requirements.

Beyond 2028, other noninterest spending as a share of GDP is projected to be about the same as projected last year, reflecting lower projections of other mandatory spending offset by higher projections of discretionary spending. The projections of other mandatory spending as a percentage of GDP are lower because such spending is projected to be slightly smaller after 10 years, and CBO projects that it will decline in relation to GDP at the same rate by which it is projected to fall between 2023 and 2028, although at a slightly slower rate than last year. The projections of discretionary spending are higher than they were last year because such spending, at the end of the 10-year period, is now higher than it was in last year's projections. (CBO assumes that discretionary spending will remain roughly constant as a share of GDP after 2028.)

Interest Costs

In CBO's projections, net interest costs are higher through the late 2030s and lower thereafter than they were a year ago (see Figure B-3). Those costs are higher initially because the agency's projections of interest rates and federal debt held by the public are likewise higher. After the late 2030s, smaller deficits and eventually smaller debt result in lower net interest costs. For the coming decade, net interest costs are projected to average 2.5 percent of GDP; last year, the projected average was 2.2 percent. They are projected to equal 3.1 percent of GDP by 2028 (up 0.2 percentage points from last year's projections) and 6.0 percent of GDP by 2047 (down 0.2 percentage points from last year's projections).

Changes in Projected Revenues

In CBO's current projections, revenues measured as a percentage of GDP are lower through 2026 than they were in last year's projections, similar for most of the following two decades, and then slightly higher by the end of the 30-year projection period. They equal 16.6 percent of GDP this year (which is 1.5 percentage points lower than last year's estimate) and then rise to 18.1 percent of GDP in 2026 (which is 0.2 percentage points lower than last year's estimate). Those downward revisions are the result of recently enacted legislative changes and increased projections of GDP. In particular, provisions of the 2017 tax act temporarily reduced individual income tax rates, nearly doubled the standard deduction, modified or eliminated certain deductions or exemptions, and temporarily allowed firms to deduct the cost of capital investments immediately.

Measured as a share of GDP, revenues in 2027 are projected to be largely the same as in last year's projections,

following the scheduled expiration of most of the individual income tax provisions of the 2017 tax act.[8] From 2027 to 2038, projected revenues average 18.8 percent of GDP (which is equal to last year's estimate). But by 2047, revenues are projected to be 0.2 percentage points higher than projected a year ago. That is because individual income taxes are now projected to grow more quickly through most of the projection period as a result of a change in the price index that is used to adjust tax brackets.[9] As a consequence, income will be pushed into higher tax brackets more quickly than projected a year ago.

Those effects are partially offset by a change in CBO's projection of the distribution of earnings. Specifically, the agency has lowered its projection of the share of earnings that will accrue to the highest earners over the next 30 years (though it still projects that earnings will grow more quickly for higher-income people than for others). The change causes a smaller share of income to be taxed at higher rates under the individual income tax, reducing receipts from that tax source. That decrease is largely offset by an increase in projected payroll taxes, as a smaller increase in the share of income accruing to the highest earners results in more earnings falling below the maximum amount subject to Social Security payroll taxes.

Changes in Social Security's Projected Finances

A common measure of the sustainability of a program that has a trust fund and a dedicated revenue source is its estimated actuarial balance over a given period—that is, the sum of the present value of projected tax revenues and the current trust fund balance minus the sum of the present value of projected outlays and a year's worth of benefits at the end of the period.[10] When that balance is negative, it is a deficit.

The 75-year actuarial deficit currently projected for Social Security is 1.5 percent of GDP (which is the same as estimated last year) or 4.4 percent of taxable payroll (which is smaller than last year's estimate of 4.5 percent). That reduction resulted from a number of factors. CBO has lowered its projection of nominal outlays for Social Security over the next 10 years and increased its projection of the share of earnings that are subject to Social Security payroll taxes over the next 30 years.[11] In addition, the agency projects slightly higher interest rates over the 75-year period. Partially offsetting those effects is an increase in the actuarial deficit that results each year from incorporating another year of relatively large deficits into the analysis.[12]

Another commonly used measure of Social Security's sustainability is its trust funds' date of exhaustion. CBO projects that if current law did not change, the Disability Insurance Trust Fund would be exhausted in fiscal year 2025, the Old-Age and Survivors Insurance (OASI) Trust Fund would be exhausted in calendar year 2032, and the combined trust funds would be exhausted in calendar year 2031. Last year, those exhaustion dates were two years earlier for the DI trust fund, one year earlier for the OASI trust fund, and one year earlier for the combined funds. The changes in those dates are the result of the lower projections of nominal outlays from the trust funds, the higher projections of interest rates on balances in the trust funds, and higher projections of revenues into the trust funds. The revenues are projected to be higher because of increased projections of earnings relative to last year and because the projected share of earnings that is subject to Social Security payroll taxes has grown.

8. For more information about the effects of the 2017 tax act, see *The Budget and Economic Outlook: 2018 to 2028* (April 2018), Appendix B, www.cbo.gov/publication/53651, and Box 1 on page 26 of this report.

9. Beginning in 2018, the measure used for adjusting most parameters of the tax system will be changed from the standard consumer price index for urban consumers (CPI-U) to the chained CPI-U. The chained CPI-U tends to grow more slowly than the standard CPI-U because it uses a formula that better accounts for households' tendency to substitute similar goods and services for each other when relative prices change and because, unlike the CPI-U, it is little affected by statistical bias related to the sample sizes that the Bureau of Labor Statistics uses in computing each index. Historically, inflation as measured by the chained CPI-U has been 0.25 percentage points lower, on average, than inflation as measured by the standard CPI-U. CBO's projections reflect that average difference between the two measures.

10. A present value is a single number that expresses a flow of past and future income or payments in terms of an equivalent lump sum received or paid at a specific time. The value depends on the rate of interest, known as the discount rate, used to translate past and future cash flows into current dollars at that time. To account for the difference between the trust fund's current balance and the balance desired for the end of the period, the balance at the beginning is added to projected tax revenues, and an additional year of costs at the end of the period is added to projected outlays.

11. Beyond the 30-year projection period, the share of earnings subject to Social Security payroll taxes is held constant in CBO's projections.

12. The actuarial deficit includes the trust fund balance at the beginning of the projection period, and that balance represents the present value of all income and costs to the trust funds since their beginning.

List of Tables and Figures

Tables

Figures

About This Document

This volume is one of a series of reports on the state of the budget and the economy that the Congressional Budget Office issues each year. In keeping with CBO's mandate to provide objective, impartial analysis, the report makes no recommendations.

Overseen by Julie Topoleski and prepared with guidance from Devrim Demirel, Ed Harris, John Kitchen, John McClelland, David Weaver, and Jeff Werling, the report represents the work of many analysts at CBO. Stephanie Hugie Barello wrote the main text of the report. Aaron Betz, Edward Gamber, and Charles Pineles-Mark wrote Appendix A. Ricci Reber wrote Appendix B. Susan Beyer, Barry Blom, Tom Bradley, Sebastien Gay, Lori Housman, Jamease Kowalczyk, Sarah Masi, Eamon Molloy, Sam Papenfuss, Lisa Ramirez-Branum, Dan Ready, Robert Stewart, and Rebecca Yip contributed to the analysis.

Michael Simpson developed the long-term budget simulations with assistance from Stephanie Hugie Barello, Marina Miller, Xiaotong Niu, and Charles Pineles-Mark. Aaron Betz and Robert Shackleton prepared the macroeconomic simulations. Ed Harris coordinated the revenue simulations, which were prepared by Paul Burnham, Shannon Mok, Cecilia Pastrone, Kurt Seibert, and Joshua Shakin. Justin Lee, Claire Sleigh, and Adam Staveski fact-checked the report. The report builds on the 10-year projections of the economy and budget that CBO released earlier this year, which reflected the contributions of more than 100 people at the agency.

Wendy Edelberg, Mark Hadley, Jeffrey Kling, and Robert Sunshine reviewed the report. Christine Bogusz, Benjamin Plotinsky, and Elizabeth Schwinn edited it, and Casey Labrack prepared it for publication. Charles Pineles-Mark and Ricci Reber prepared the supplemental data.

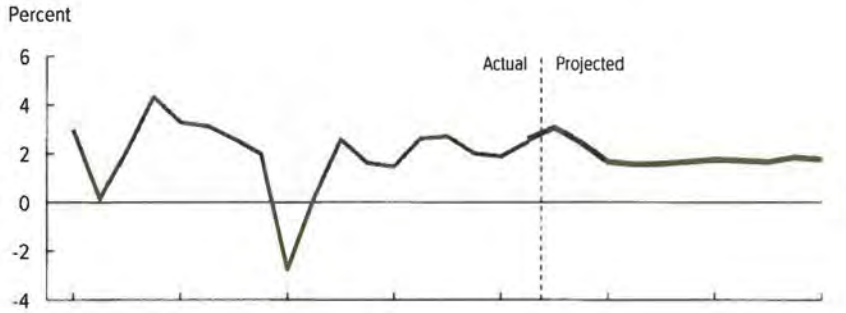
The report is available on CBO's website (www.cbo.gov/publication/53919).

Keith Hall
Director
June 2018

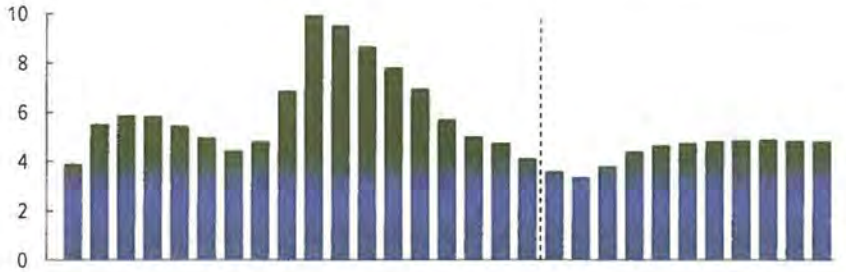
CONGRESS OF THE UNITED STATES
CONGRESSIONAL BUDGET OFFICE

CBO

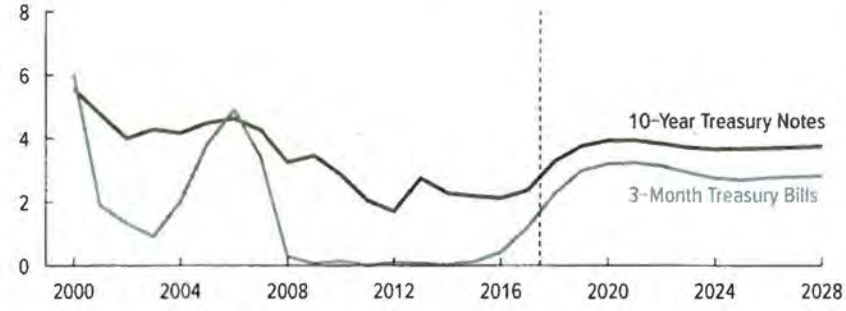
An Update to the Economic Outlook: 2018 to 2028



In CBO's forecast, **real GDP growth**, spurred by fiscal stimulus, is 3.1 percent this year and 2.4 percent next year.



That growth creates excess demand in the economy and lowers the **unemployment rate** through next year.



Interest rates rise over the next few years as the Federal Reserve raises the federal funds rate to reduce excess demand and the associated inflationary pressures.

AUGUST 2018

Notes

Unless otherwise indicated, all years referred to in describing the economic outlook are calendar years.

Numbers in the text, tables, and figures may not add up to totals because of rounding. Also, some values are expressed as fractions to indicate numbers rounded to amounts greater than a tenth of a percentage point.

Some figures in this report have vertical bars that indicate the duration of recessions. (A recession extends from the peak of a business cycle to its trough.)

The Congressional Budget Office completed its current economic forecast in early July 2018. Unless otherwise indicated, projections of economic variables presented in this report are based on information that was available at that time. Thus, the projections do not reflect the comprehensive update to the national income and product accounts that the Bureau of Economic Analysis released on July 27. However, the actual and historical data shown in figures describing the economic forecast are based on that update, as are the discussions of recent economic events in the text.

This report does not include updates to CBO's baseline budget projections. The agency's most recent budget projections were released in May as part of *An Analysis of the President's 2019 Budget* (www.cbo.gov/publication/53884).

Supplemental data for this analysis are available on CBO's website (www.cbo.gov/publication/54318), as is a glossary of common budgetary and economic terms (www.cbo.gov/publication/42904).

Contents

An Update to the Economic Outlook: 2018 to 2028

Summary

The Congressional Budget Office regularly updates its economic forecast to incorporate changes in the agency's methodology and to ensure that the projections reflect recent economic developments and current law. This report presents the agency's latest economic forecast, which includes the following key projections of real (inflation-adjusted) gross domestic product (GDP) and other factors:

- **In 2018, real GDP is projected to grow by 3.1 percent.** That is about 0.6 percentage points faster than the pace of its growth in 2017 (see Figure 1). The pickup in growth is largely the result of increases in government spending, reductions in taxes, and faster growth in private investment. For the second half of the year, CBO expects real GDP to grow at roughly the same average pace as it grew in the first half of the year, which would represent a moderation following the 4.1 percent annualized growth of GDP reported in the second quarter. Such moderation occurs because several factors that boosted second-quarter growth—including a rebound in the growth of consumer spending from a weak first quarter and a surge in agricultural exports—are expected to either fade or reverse. In 2019, the pace of GDP growth slows to 2.4 percent in the agency's forecast as growth in business investment and government purchases slows.

- **Growth of actual output is expected to outpace the growth of its maximum sustainable amount through the rest of 2018 and 2019, creating excess demand in the economy.** Although that growth in actual output leads to lower unemployment rates and higher income in CBO's forecast, it also creates demand for goods, services, and labor that exceeds the economy's long-run capacity to supply them.

- **Excess demand will put upward pressure on prices, wages, and interest rates over the next few years.** In CBO's forecast, the growth of actual output slows markedly after 2019 because higher interest rates, along with the slower growth of federal outlays projected under current law, restrain demand. As the excess demand dissipates, the unemployment rate rises and inflation and interest rates fall. By 2022, the excess demand in the economy disappears.

- **From 2023 to 2028, real GDP is projected to grow by about 1.7 percent each year.** That is slightly slower than potential output grows, on average. (Potential output is CBO's estimate of the maximum sustainable output of the economy.) The difference between actual and potential output arises because of a slight, temporary slowdown in the growth of actual output from 2025 to 2026, when some of the major provisions of the 2017 tax act (Public Law 115-97, originally called the Tax Cuts and Jobs Act) are scheduled to expire.

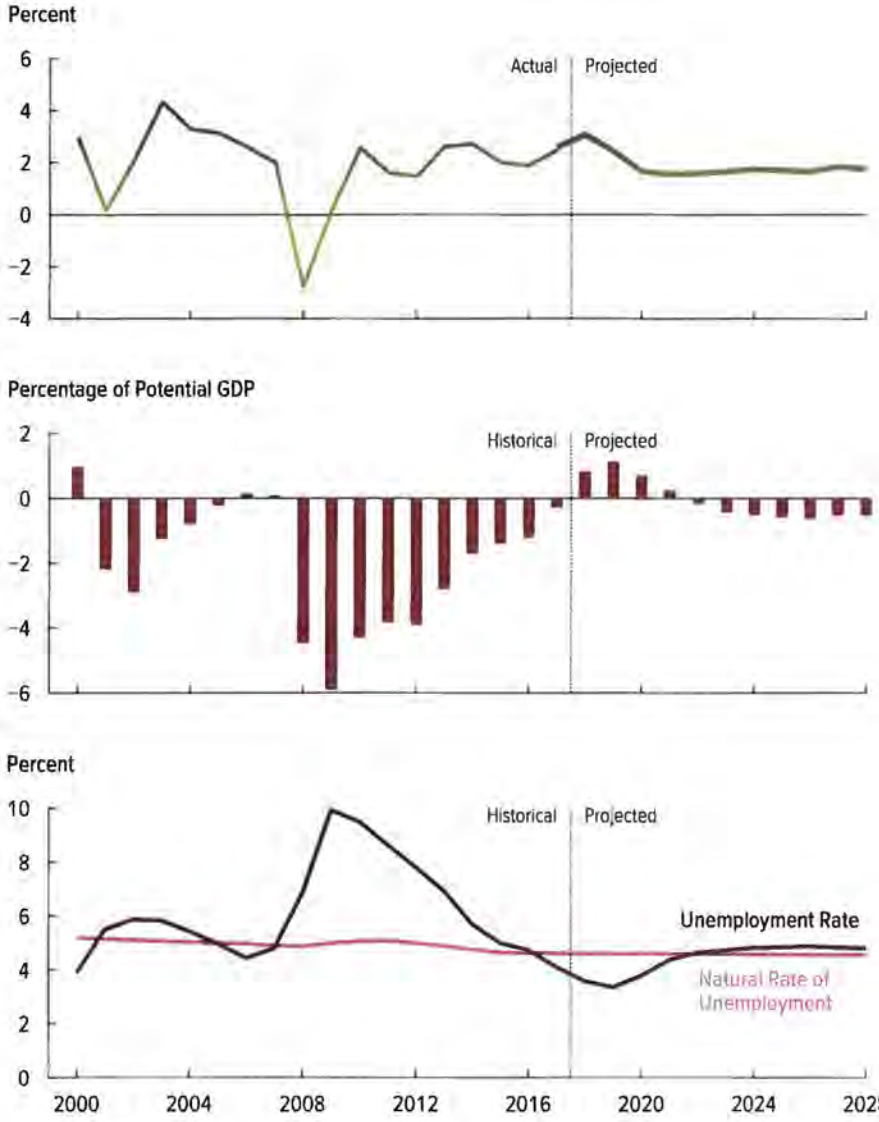
Although CBO's current economic forecast does not differ significantly from the forecast that the agency published in April 2018, it nevertheless incorporates several important changes. For example, the current forecast is based on the path for discretionary spending specified in CBO's most recent budget projections, which were released in May.[1] That path includes less fiscal stimulus over the next few years than did the path that the agency used when it previously projected economic growth. That revision slightly lowered the agency's projections of output growth and interest rates in the near term. Additionally, CBO has further revised downward its forecast of interest rates over much of the projection period on the basis of information about financial markets and the projections of other forecasters. It has also revised slightly upward its near-term inflation forecast on the basis of recent data on consumer prices.

The economic projections in this report do not differ significantly from those of other forecasters. They are slightly stronger in the near term than most of the

1. See Congressional Budget Office, *An Analysis of the President's 2019 Budget* (May 2018), Table 1, www.cbo.gov/publication/53884.

Figure 1.

CBO's Economic Forecast at a Glance



In CBO's forecast, **real GDP growth**, spurred by fiscal stimulus, is 3.1 percent this year and 2.4 percent next year.

That growth creates excess demand in the economy, which pushes GDP above potential GDP, resulting in a positive **output gap** and . . .

. . . lowering the **unemployment rate** below CBO's estimate of the **natural rate of unemployment**.

Sources: Congressional Budget Office; Bureau of Economic Analysis; Bureau of Labor Statistics; Federal Reserve.

Real values are nominal values that have been adjusted to remove the effects of changes in prices. Real GDP growth is measured from the fourth quarter of one calendar year to the fourth quarter of the next.

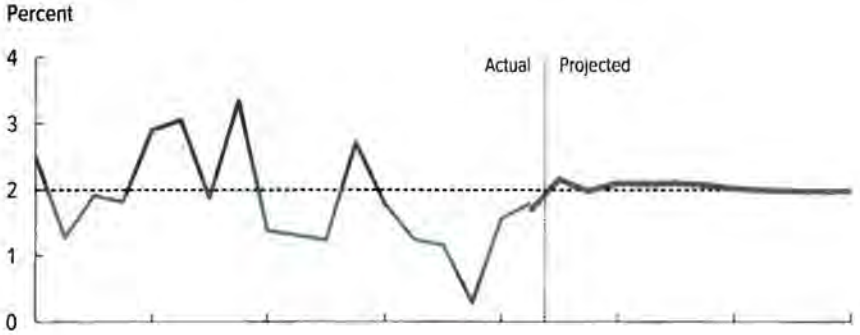
Excess demand exists when the demand for goods and services exceeds the amount that the economy can sustainably supply. Potential GDP is CBO's estimate of the maximum sustainable output of the economy. The output gap is the difference between GDP and potential GDP, expressed as a percentage of potential GDP. A positive value indicates that GDP exceeds potential GDP; a negative value indicates that GDP falls short of potential GDP. Values for the output gap are for the fourth quarter of each year.

The unemployment rate is the number of jobless people who are available for and actively seeking work, expressed as a percentage of the labor force. The natural unemployment rate is the rate arising from all sources except fluctuations in the overall demand for goods and services. For the unemployment rate and the natural unemployment rate, data are fourth-quarter values.

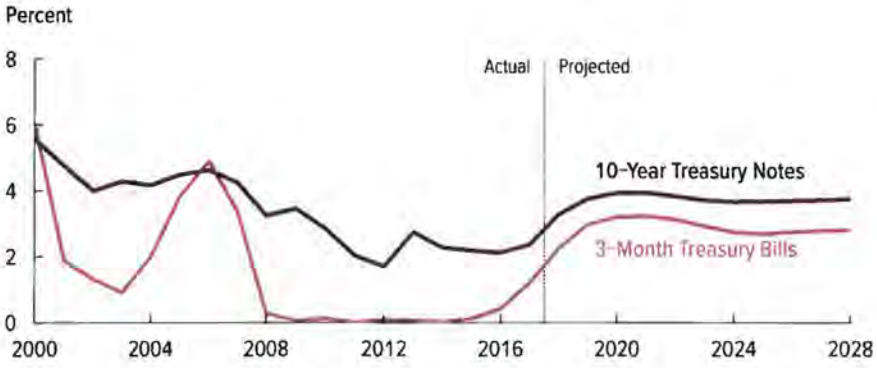
Continued

Figure 1. Continued

CBO's Economic Forecast at a Glance



Excess demand also pushes the rate of **inflation in consumer prices** above the Federal Reserve's target of 2 percent this year.



Interest rates rise over the next few years as the Federal Reserve raises the federal funds rate to reduce excess demand and the associated inflationary pressures.

The projected **growth of real potential GDP** (the sum of the growth of the potential labor force and the growth of potential labor force productivity) is faster than it has been since 2008 but slower than it was in previous periods.

Inflation in consumer prices is based on the price index for personal consumption expenditures and is measured from the fourth quarter of one calendar year to the fourth quarter of the next.

The federal funds rate is the interest rate that financial institutions charge each other for overnight loans of their monetary reserves. The data for interest rates are fourth-quarter values.

Potential labor force productivity is the ratio of real potential GDP to the potential labor force, which is CBO's estimate of the size of the labor force arising from all sources except fluctuations in the overall demand for goods and services. The bars show compound annual growth rates over the specified periods calculated using calendar year data.

Values for real GDP growth and inflation in consumer prices from 2000 to 2017 (the thin line in the top panel on each page) reflect revisions to the national income and product accounts that the Bureau of Economic Analysis released on July 27, 2018. Values from 2017 to 2028 (the thick lines) reflect the data available when the projections were made in early July.

GDP = gross domestic product.

forecasts by the private-sector economists who contributed to the July 2018 *Blue Chip Economic Indicators*. They are somewhat stronger in the near term and weaker in the long term than the latest forecasts by Federal Reserve officials.

The Economic Effects of Recent Changes in Fiscal Policy

Three pieces of legislation enacted in the past year significantly affected fiscal policy and CBO's economic outlook.[2] The first, the 2017 tax act, permanently lowered the top corporate income tax rate to 21 percent and changed the way that business's foreign income is taxed. The act also lowered individual income tax rates and broadened the base of income subject to tax through 2025. In addition, it included various provisions that affect how businesses and individuals calculate their taxable income. The two other pieces of legislation affected spending. The Bipartisan Budget Act of 2018 (P.L. 115-123) increased the caps on discretionary funding for 2018 and 2019 and provided substantial funding for emergency assistance. The Consolidated Appropriations Act, 2018 (P.L. 115-141), provided appropriations for all discretionary accounts for 2018.

As noted in its April 2018 report, CBO estimates that the 2017 tax act will have appreciable effects on the U.S. economy. The lower marginal income tax rates that will be in place for much of the projection period will encourage workers to work more hours and businesses to increase investment in productive capital, thereby raising potential output over the entire projection period.[3] In addition, higher disposable (after-tax) income for households will, in CBO's estimate, boost the demand for goods and services, raising actual GDP slightly above its potential and generating some inflationary pressure during the first half of the projection period. In the meantime, those effects will be partly offset by the larger deficits created by the tax act. In later years, as many temporary provisions of the 2017 tax act phase out or expire, growth of actual GDP falls below the growth of potential output in CBO's projections, but the law's total effect on the levels of investment, employment, and output remains positive through 2028. That occurs because the positive effect on incentives from the provisions that were still in place would more than offset the negative effect of greater federal borrowing.

The increases in federal outlays in the next few years that result from the Bipartisan Budget Act of 2018 and the Consolidated Appropriations Act, 2018, will boost aggregate demand and increase the federal budget deficit in the near term, CBO estimates. In CBO's projections, the additional federal spending adds to the existing excess demand and inflationary pressures. Higher interest rates and greater federal borrowing ultimately "crowd out" some private activities, particularly private investment, in later years.

CBO's economic projections incorporate the federal deficits in the agency's adjusted baseline budget projections that were published in May. Each year's federal budget deficit is linked to the flows of domestic saving and investment, as well as to the current-account balance (see Box 1).[4] In CBO's current economic projections, federal deficits and current-account deficits rise for the next few years, reflecting increases in borrowing by the federal government and increases in lending to the United States by foreign investors.

The Economic Outlook for 2018 to 2022

CBO expects real GDP to grow by 3.1 percent this year, by 2.4 percent in 2019, and by an average of 1.6 percent each year from 2020 through 2022 (see Table 1).[5] Most

2. In the agency's previous economic forecast, published in April 2018, CBO presented its estimate of the effects of those fiscal policy changes on the U.S. economy over the next 11 years. See Congressional Budget Office, *The Budget and Economic Outlook: 2018 to 2028* (April 2018), www.cbo.gov/publication/53651.

3. A marginal tax rate is the percentage of an additional dollar of income that is paid in taxes. For details on how CBO projects potential output, see Robert Shackleton, *Estimating and Projecting Potential Output Using CBO's Forecasting Growth Model*, Working Paper 2018-03 (Congressional Budget Office, February 2018), www.cbo.gov/publication/53558.

4. The current-account balance is a summary measure of a country's current transactions with the rest of the world, including net exports, net unilateral transfers, and net income from abroad.

5. CBO completed its economic projections in early July, and therefore the projections do not reflect the benchmark revision of the national income and product accounts (NIPAs), which the Bureau of Economic Analysis (BEA) released on July 27. This year's comprehensive update included several important changes to NIPA definitions and methods that affected historical data from 1929 through the first quarter of 2018. In addition, BEA also released an early estimate for the second quarter of 2018. CBO's initial review of those recently released data suggested that they would not substantially change the projections of GDP growth and of other key economic variables that are presented in this report. That said, CBO's estimate of potential GDP also depends on the revised information on capital stock, which has not yet been released.

Table 1.

CBO's Economic Projections for Calendar Years 2018 to 2028

	Actual, 2017	2018	2019	2020	Annual Average 2021–2022	Annual Average 2023–2028
	Percentage Change From Fourth Quarter to Fourth Quarter					
Gross Domestic Product						
Real[a]	2.6	3.1	2.4	1.7	1.6	1.7
Nominal	4.5	5.1	4.7	3.9	3.8	3.9
Inflation						
PCE price index	1.7	2.2	2.0	2.1	2.1	2.0
Core PCE price index[b]	1.5	2.1	2.1	2.2	2.1	2.0
Consumer price index[c]	2.1	2.5	2.3	2.5	2.5	2.4
Core consumer price index[b]	1.7	2.3	2.6	2.7	2.5	2.4
GDP price index	1.9	2.0	2.2	2.2	2.2	2.1
Employment Cost Index[d]	2.8	3.4	3.6	3.6	3.4	3.1
	Fourth-Quarter Level (Percent)					
Unemployment Rate	4.1	3.6	3.4	3.8	4.6[e]	4.8[f]
	Percentage Change From Year to Year					
Gross Domestic Product						
Real[a]	2.3	3.0	2.8	1.9	1.6	1.7
Nominal	4.1	5.1	4.9	4.1	3.8	3.9
Inflation						
PCE price index	1.7	2.1	2.0	2.1	2.1	2.0
Core PCE price index[b]	1.5	1.9	2.1	2.2	2.1	2.0
Consumer price index[c]	2.1	2.5	2.2	2.5	2.5	2.4
Core consumer price index[b]	1.8	2.2	2.4	2.7	2.6	2.4
GDP price index	1.8	2.0	2.1	2.2	2.2	2.1
Employment Cost Index[d]	2.6	3.1	3.4	3.6	3.5	3.1
	Annual Average					
Unemployment Rate (Percent)	4.4	3.8	3.4	3.6	4.4	4.8
Payroll Employment (Monthly change, in thousands)[g]	181	210	178	63	26	57
Interest Rates (Percent)						
Three-month Treasury bills	0.9	1.9	2.8	3.1	3.2	2.8
Ten-year Treasury notes	2.3	3.0	3.6	3.9	3.9	3.7
Tax Bases (Percentage of GDP)						
Wages and salaries	43.1	43.1	43.4	43.7	43.9	44.1
Domestic corporate profits[h]	8.9	9.5	9.6	9.1	8.6	8.3

Sources: Congressional Budget Office; Bureau of Economic Analysis; Bureau of Labor Statistics; Federal Reserve.

GDP = gross domestic product; PCE = personal consumption expenditures.

a. Real values are nominal values that have been adjusted to remove the effects of changes in prices.

b. Excludes prices for food and energy.

c. The consumer price index for all urban consumers.

d. The employment cost index for wages and salaries of workers in private industry.

e. Value for the fourth quarter of 2022.

f. Value for the fourth quarter of 2028.

g. The average monthly change, calculated by dividing by 12 the change in payroll employment from the fourth quarter of one calendar year to the fourth quarter of the next.

h. Consists of domestic profits, adjusted to remove distortions in depreciation allowances caused by tax rules and to exclude the effect of inflation on the value of inventories.

Box 1.

Federal Deficits, Domestic Saving and Investment, and the Current-Account Balance

Federal deficits reduce national saving (total saving by households, businesses, and governments) and the amount of funds available for private investment in productive capital.[1] The reduction in the amount of funds depends on the magnitude of the resulting increases in private saving and in net inflows of foreign capital (foreign purchases of U.S. assets minus U.S. purchases of foreign assets). Because federal deficits are linked to domestic and foreign saving and investment flows, the Congressional Budget Office considers the interactions among the following three saving-investment balances when it assesses current fiscal and financial conditions and prepares its economic forecast (see the figure):

- *The federal budget balance*—the difference between the federal government's revenues and outlays. When the federal government runs a budget deficit (that is, when outlays exceed revenues), the Treasury borrows money by selling securities to the general public.[2] The funds for such borrowing come from two principal sources: nonfederal domestic entities (businesses, nonprofit organizations, households, and state and local governments) and foreign investors (government and private). For example, when federal borrowing rises, U.S. businesses may increase their lending to the U.S. government by reallocating their saving from private assets (and thus decreasing investment in capital) or by increasing their rate of saving. In addition, foreign governments and private investors may increase their investment in U.S. debt. The United States' federal budget balance has been in deficit since the 1970s except for in fiscal years 1998 to 2001.
- *The current-account balance*—the difference between exports and imports (net exports, a measure often referred to as the trade balance), plus net international income (the difference between the income earned by U.S. residents from foreign sources and the income earned by foreign individuals from U.S. sources) and net international transfers (the difference between the inflows and outflows of transfer payments, such as remittances and foreign aid). A country's current-account balance reflects the amount of its domestic saving (by both private- and public-sector entities) compared with the amount of investment in that country. When a country runs a current-account deficit, it borrows from abroad to finance an excess of investment over saving. In other words, a country with a current-account deficit is a net borrower on international markets, whereas a country with a current-account surplus is a net lender. The U.S. current account has been in deficit since the early 1980s. Though current-account deficits are a sign of strong foreign demand for investments in the United States, large and sustained current-account deficits have often served as a prelude to disruptive economic and financial events.
- *The nonfederal domestic balance*—the difference between saving and investment of nonfederal domestic entities, which is calculated here by subtracting the federal budget balance from the current-account balance. In most years, this balance is positive, indicating that, taken together, nonfederal domestic entities are net lenders. When the balance is negative, as it was from 1997 through 2008, the current-account deficit exceeds the federal deficit and the nonfederal domestic entities are net borrowers.

The interactions among those balances reflect, and help to illustrate, underlying developments in the economy over time. For example, the unique pattern of the balances in the early years of this century reflected increased borrowing by households and businesses that later proved to be unsustainable. Starting with the recession of 2001 and continuing through the expansion of the early- to mid-2000s, both the federal government and the U.S. domestic private sector were net borrowers. That borrowing was funded by foreign investors, and current-account deficits climbed throughout the period, reaching an all-time high of 6.0 percent of gross domestic product (GDP) in fiscal year 2006. Following the onset of the 2007–2009 recession, the private sector drastically cut its borrowing while the federal government's borrowing dramatically increased. On net, the current-account deficit fell to 3.0 percent of GDP at the trough of the recession in 2009. From 2009 through 2017, current-account deficits averaged 2.7 percent of GDP.

1. See Jonathan Huntley, *The Long-Run Effects of Federal Budget Deficits on National Saving and Private Domestic Investment*, Working Paper 2014-02 (Congressional Budget Office, February 2014), www.cbo.gov/publication/45140.

2. The federal government also borrows for other purposes, including to adjust cash balances and to manage the cash flows associated with federal credit programs such as student loans. This analysis is concerned only with borrowing used to fund the federal deficit.

Continued

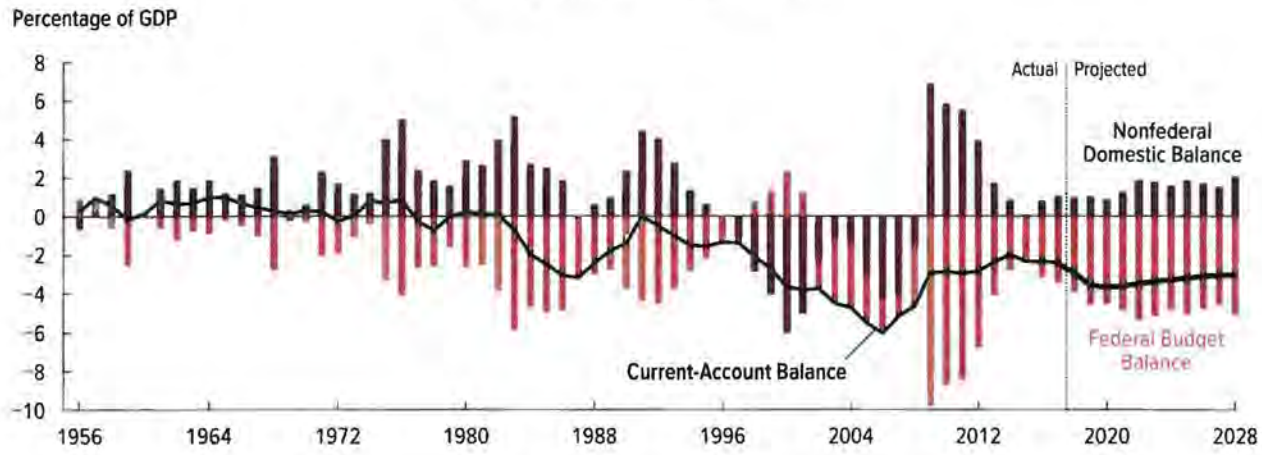
Box 1. Continued

Federal Deficits, Domestic Saving and Investment, and the Current-Account Balance

The pattern of the three balances shifts somewhat over time in CBO's projections. In the near term, the current-account deficit rises from 2.4 percent of GDP in 2017 to 3.6 percent in 2021, driven mainly by growing federal budget deficits. In the baseline budget projections that CBO published in May, federal deficits as a share of GDP rise by roughly 1.4 percentage points between 2017 and 2021, from 3.5 percent to 4.9 percent. The nonfederal domestic balance stays roughly stable over that same period, averaging 1.0 percent of GDP each year.

From 2022 to 2028 in CBO's forecast, the current-account deficit shrinks steadily to 3.0 percent of GDP. That occurs despite the fact that federal budget deficits remain elevated, hovering around 5 percent of GDP. The current-account deficit shrinks primarily because of projected slower growth in domestic investment relative to saving, which is reflected in an increasing nonfederal domestic balance. In CBO's projections, that balance rises from 1.3 percent of GDP in 2021 to 2.1 percent in 2028.

Saving-Investment Balances



Sources: Congressional Budget Office; Bureau of Economic Analysis; Office of Management and Budget.

The federal budget balance is the difference between revenues and spending. The current-account balance is the difference between exports and imports (net exports), plus net international income (the difference between the income earned by U.S. residents from foreign sources and the income earned by foreign individuals from U.S. sources) and net international transfers (the difference between the inflows and outflows of transfer payments, such as remittances and foreign aid). The nonfederal domestic balance is the current-account balance minus the federal budget balance. It is primarily the difference between saving and investment in the private sector and the state and local government sector.

Values for 2000 to 2017 reflect revisions to the national income and product accounts that the Bureau of Economic Analysis released on July 27, 2018. Values for 2018 to 2028 (and for the current-account balance, those for 2017 to 2028 represented by the thick line) reflect the data available when the projections were made in early July.

All years are fiscal years.

GDP = gross domestic product.

of the growth of output in CBO's forecast over the next few years is driven by consumer spending and, to a lesser extent, business investment. In addition, in 2018 and 2019, demand from the federal, state, and local governments, on net, adds to the growth of output while net exports (exports minus imports) generally offset those contributions to GDP growth.

Output growth is expected to exceed the growth of potential output over the next two years and create excess demand for goods and services in the economy. Since the 2007–2009 recession ended, real GDP has grown faster than real potential GDP, on average, reducing the gap between the two. By early this year, output was about equal to potential output, and the output gap—the difference between actual and potential GDP, expressed as a percentage of potential GDP—was closed. As the growth of actual output continues to outpace the growth of potential output through most of next year, the output gap widens in CBO's forecast until late 2019 and remains positive until late 2022.

That excess demand for goods and services leads to a heightened demand for workers in CBO's forecast, which lowers the unemployment rate below the agency's estimate of the natural rate of unemployment. (The natural rate of unemployment is the rate arising from all sources other than fluctuations in the overall demand for goods and services, including normal job turnover and the structural mismatch between the skills that jobs require and those that job seekers possess.)

The excess demand also puts upward pressure on interest rates and price and wage inflation. Those higher interest rates, along with slower growth in federal spending, in turn restrain growth in later years.

Actual Output (Gross Domestic Product)

Economic growth was uneven but fairly robust, on average, in the first half of 2018. Real GDP growth started at an annual rate of just 2.2 percent in the first quarter of this year before accelerating to 4.1 percent in the second quarter. However, the strong second-quarter growth was boosted in large part by a rebound in the growth of consumer spending after recent weakness and a surge in agricultural exports, neither of which will, in CBO's view, persist in the second half of this year.

Despite the volatility in the rate of GDP growth in the first and second quarters of the year, CBO expects the momentum underlying that growth to largely continue into the second half of the year before slowing gradually in subsequent years. CBO estimates that real GDP will grow by a total of 3.1 percent in 2018 (up from 2.5 percent in 2017) and by 2.4 percent in 2019. Growth of real GDP is expected to slow further after 2019, averaging 1.6 percent per year between 2020 and 2022.

In CBO's projections, the above-trend growth of real GDP in 2018 mainly reflects robust growth in business fixed investment (businesses' purchases of equipment, nonresidential structures, and intellectual property products) and purchases by the federal, state, and local governments. Consumer spending, which accounts for more than two-thirds of economic output, grows relatively modestly, on average, in 2018 before picking up momentum in 2019 and supporting real output growth when growth in investment and government purchases slows down. By contrast, net exports make a slightly negative contribution to GDP growth in both 2018 (despite a surge in the second quarter) and 2019. From 2020 to 2022, GDP growth in CBO's forecast reflects primarily continued moderate growth in consumer spending but also growth in business and residential investment; total government purchases and net exports have little impact on GDP growth after 2019.

Consumer Spending. CBO expects that consumer spending on goods and services will grow by 2.1 percent in 2018—less than the 2.7 percent that such spending grew in 2017—and by 2.9 percent in 2019; such growth is projected to account for less than half of the growth of real GDP in 2018 but more than three-quarters of output growth in 2019. In CBO's projections, growth in consumer spending stems mainly from growth in disposable income, which reflects a combination of rising labor and capital income in the strong economy and lower income tax rates under current law. However, the agency anticipates that many households will respond to the smaller personal tax liabilities gradually and that the effect of increases in after-tax income will therefore not fully translate into more consumer spending until 2019. (Consumer spending did grow robustly in the second quarter of 2018; however, in CBO's view, that growth mainly reflects a rebound from a very weak first quarter.) Rising gasoline prices, which dampen the gains in real income, also restrain the growth in real consumption in 2018. In the meantime, household financial conditions, which include continuing gains in household wealth and increasing access to credit, are expected to be broadly

supportive of consumer spending. Annual growth in consumer spending slows in the agency's projections to 2.2 percent in 2020 and to less than 2.0 percent in 2021 and 2022 as interest rates and prices rise and growth in income slows.

Business Investment. In CBO's projections, the pace of growth in real business investment accelerates significantly in 2018, reaching 8.9 percent (substantially faster than the 5.3 percent growth recorded in 2017) and accounting for nearly one-third of the growth of real GDP for the year. That robust growth in business investment reflects several factors: increased incentives for investment under the 2017 tax act, the accelerated growth of output that stems in part from the tax act and the legislated increases in federal outlays, a rebound from the unusually weak inventory investment in late 2017 and the most recent quarter, greater incentives for oil exploration and development created by higher oil prices, and the easing of existing regulations coupled with a slowdown in new regulatory activity.

Growth in business investment gradually slows between 2019 and 2022 in the agency's forecast, as most of the effect of those forces on growth wanes. In particular, although provisions in the tax act increase incentives in those years, they do so by less each year than they do in 2018 and thus lead to less growth in investment. In addition, GDP growth slows in those years as the fiscal stimulus provided by federal spending diminishes and as an increasing supply of oil puts downward pressure on oil prices and slows investment in oil drilling.

Residential Investment. CBO anticipates that growth in real residential investment will remain subdued in 2018 before picking up considerably in subsequent years. In the agency's projections, real residential investment grows by 2.5 percent in 2018 (down from 3.8 percent in 2017), by 5.0 percent in 2019, and by an average of 4.1 percent each year from 2020 to 2022. The slow growth in residential investment in 2018 is attributable in part to the 2017 tax act, which included provisions that reduced the incentives to own homes. The subsequent pickup in growth from 2019 through 2022, by contrast, mainly reflects the continued strength in household formation and the continued easing of mortgage lending standards.

Government Purchases. If current laws governing federal taxes and spending generally remained in place, total real purchases of goods and services by the federal, state, and local governments would increase by 2.8 percent in 2018 and by only 0.5 percent in 2019, CBO estimates. From 2020 to 2022, the growth of total real government spending is projected to largely disappear because of a sharp decrease in federal purchases that is only partially offset by an increase in state and local purchases. Specifically, in CBO's projections, real purchases by the federal government fall by an average rate of roughly 1 percent per year from 2020 to 2022, reflecting the existing caps on discretionary funding in place through fiscal year 2021 and the assumption that funding will grow at the rate of inflation thereafter. By contrast, real purchases by state and local governments are projected to increase at an average annual rate of 0.9 percent in those years as both demand for their services and the tax revenue that funds those services rise.

Net Exports. After declining for several years, real net exports are projected to continue to decline through 2019 before stabilizing over the following three years. In CBO's current economic projections, real imports grow faster, on average, than real exports in both 2018 and 2019. (Although there was a surge in agricultural exports in the second quarter of 2018, it will, in the agency's view, be reversed over the second half of the year.) Over the next two years, strong growth in demand in the United States will, in CBO's estimate, boost the growth rate of real imports of goods and services. The growth of real exports, by contrast, is projected to slow in those years because the agency expects that the economies of the United States' trading partners will experience a moderate slowdown in GDP growth. The exchange value of the dollar is expected to remain relatively stable through 2019.[6] As a result of those factors, in CBO's projections, real net exports decline and subtract 0.2 percentage points from GDP growth in both 2018 and 2019.[7] After 2019, the effects of those factors diminish, slowing the decline in real net exports. From 2020

6. CBO's measure of the exchange value of the dollar is an export-weighted average of the exchange rates between the dollar and the currencies of the United States' leading trading partners.

7. Although a decline in net exports appears to make negative contributions to GDP growth in 2018 and 2019 in CBO's projections, that does not imply that an increase in imports will reduce GDP growth. Increases in imports reduce the contribution of net exports to GDP growth, but they also contribute positively to other components of GDP growth because imports are included in domestic demand as part of consumption, investment, and government spending.

through 2022, real net exports have little impact on GDP growth.

Recent changes to tariffs made by the United States and its trading partners are expected to reduce trade between them. Since the beginning of this year, the United States has raised tariffs on imported solar panels, washing machines, steel, and aluminum. In July, it imposed additional tariffs on about $34 billion worth of Chinese goods, including semiconductors, plastics, and capital equipment.[8] In response to higher U.S. import tariffs, Canada, the European Union, and China have raised tariffs on U.S. exports. By making imported goods more costly in the United States and U.S. exports more costly abroad, those changes in tariffs are expected to reduce the volume of both real imports and exports.

Because the new tariffs that were in place when CBO completed its forecast in early July affected goods that accounted for less than 1.5 percent of the total value of U.S. trade, they had a very limited effect on CBO's economic projections. However, trade policy has already changed since early July and may continue to evolve, so the effects of new tariffs on the economy—and thus on CBO's future projections—may become more substantial. (See the discussion of trade policy changes in the section "Some Uncertainties in the Economic Outlook" below.)

Potential Output and the Output Gap

CBO's near-term forecast reflects not only anticipated fluctuations in aggregate demand but also projected changes in aggregate supply. In the agency's projections, potential output—a measure of the economy's fundamental capacity to supply goods and services—grows by an average of 2.0 percent per year from 2018 to 2022, roughly 0.6 percentage points more than it has grown annually, on average, since 2008. Although the growth of potential output is determined primarily by long-run forces (such as trends in population growth, the labor force participation rate, and productivity), the acceleration of that growth over the next few years in CBO's forecast is also driven by the 2017 tax act, which according to the agency's estimates, boosts investment (and therefore labor productivity) and labor supply and thus increases the economy's underlying productive capacity.[9]

CBO's forecasts of the growth of actual and potential GDP imply that there will be excess demand for goods and services in the economy throughout most of the 2018–2022 period. In the agency's projections, the output gap widens from zero in the first half of 2018 to a cyclical peak of 1.1 percent of potential GDP by late 2019. At the same time, as a result of the 2017 tax act, potential output growth accelerates, slowing the increase in the output gap, mitigating the inflationary pressure associated with that gap, and facilitating growth in actual output. Still, starting in 2020, higher prices and interest rates, along with the decline in federal outlays projected under current law, slow actual GDP growth in relation to the growth of potential GDP, steadily narrowing and ultimately eliminating the output gap by 2022.

The Labor Market

The labor market continued to improve in the first half of 2018. The primary measure that CBO uses to assess the degree of slack in the labor market—the employment gap, or the difference between employment and potential employment—indicated that there was no slack remaining by early 2018.[10] That elimination of slack in the labor market occurred because of a drop in the unemployment rate (which has been below its estimated natural rate since early 2017) and the continued stability of the labor force participation rate (which is approaching its potential level though it remains below it). The potential labor force participation rate is itself trending down in the long run because of demographic pressures.

In CBO's projections, the growth of aggregate demand increases demand for labor beyond its maximum sustainable level, leading to a positive employment gap for the rest of 2018 and through 2022. The employment gap peaks at roughly 2 million people in late 2019. (Employment as a percentage of the population also peaks in 2019, at about 60.7 percent.) In terms of monthly job growth, payroll employment in the nonfarm business sector grows by roughly 210,000 jobs per month in 2018 (up from 181,000 jobs per month in 2017) and by approximately 180,000 jobs per month in 2019. From 2020 to 2022, slower economic growth slows employment growth sharply—to an average of

8. CBO's economic projections were completed before those tariffs on Chinese goods took effect.

9. The labor force participation rate is the percentage of people in the civilian noninstitutionalized population who are at least 16 years old and are either working or seeking work.

10. Potential employment is CBO's estimate of the number of people who would be employed if the unemployment rate equaled its natural rate and if the labor force participation rate equaled its potential rate.

38,000 jobs per month—reducing the employment gap to about half a million workers by the end of 2022.[11]

CBO's projections of employment relative to its potential also reflect the agency's forecasts of changes in the rate of unemployment and the size of the labor force, which partly offset each other over the 2018–2022 period. In CBO's projections, the unemployment rate continues to drop, from about 4 percent in the first half of 2018 to about 3.3 percent by the end of 2019, and then rises gradually and approaches its natural rate of 4.6 percent over the 2020–2022 period as economic growth slows. The labor force, in contrast, approaches (but remains below) its estimated potential size in 2018 and 2019 and slightly exceeds its potential between 2020 and 2022. The labor force participation rate, which has hovered around 62.8 percent since 2014, remains relatively stable at that rate from 2018 through 2022 as excess demand for labor offsets demographic pressures, which continue to push down the rate's long-run trend.

The increased demand for labor and competition for workers boost the growth of hourly labor compensation (a measure that includes benefits as well as wages and salaries) in CBO's projections. The increase in labor compensation, in turn, dampens demand for labor, slowing employment growth and, by 2020, diminishing the positive employment gap. In particular, the annual growth rate of the employment cost index (ECI) for wages and salaries of workers in private industries rises from 2.8 percent in 2017 to 3.4 percent in 2018 and peaks at 3.6 percent in 2020 before slowing to 3.3 percent by 2022 and further to 3.0 percent in the long term.

Inflation

Inflation picked up considerably in late 2017 and the first half of 2018, after slowing markedly during much of 2017. The annual growth rate of the price index for personal consumption expenditures (PCE)—the measure that the Federal Reserve uses to set its long-run inflation target—reached and surpassed the target rate of 2.0 percent in the middle of 2018. Excluding food and energy prices, which tend to be volatile, the core PCE price index is also approaching 2.0 percent annual growth. Energy, health care, and shelter are among the categories with the greatest price increases. In addition, newly imposed tariffs have led to higher prices for certain imported goods; however, the effect on the prices of consumer goods—and thus the effect of those tariffs on domestic inflation—has so far been very limited.

Over the next few years, excess demand is expected to put more upward pressure on inflation. The Federal Reserve is expected to tighten monetary policy and, aided by market participants' stable expectations of future inflation, prevent inflation from substantially exceeding its long-run target. In CBO's projections, growth in the core PCE price index is 2.1 percent (measured from the fourth quarter of one year to the fourth quarter of the next) in both 2018 and 2019 and peaks at 2.2 percent in 2020. The core consumer price index for urban households (CPI-U), which historically tends to grow faster than the PCE price index, rises by 2.3 percent in 2018, by 2.6 percent in 2019, and by 2.7 percent in 2020. As interest rates rise and the excess demand in the economy dissipates, inflation slows after 2020 in CBO's forecast. By 2022, the core PCE inflation falls back to 2.1 percent, and the core CPI-U inflation, to 2.5 percent.

Interest Rates

CBO expects the Federal Reserve to continue to raise the target range for the federal funds rate (the interest rate that financial institutions charge each other for overnight loans of their monetary reserves) over the next few years in response to excess demand and increased inflationary pressures in the economy. In CBO's projections, the federal funds rate rises from 1.6 percent in the first half of 2018 to 2.8 percent in 2019 before reaching 3.4 percent, where it remains from 2020 to 2022.

The interest rates on 3-month Treasury bills and 10-year Treasury notes are also expected to be substantially higher over the next few years. The interest rate on 3-month Treasury bills rises from 1.9 percent in the first half of 2018 to 2.8 percent in 2019 and to 3.2 percent by 2021; it falls slightly after 2021 as excess demand for goods and services diminishes and inflationary pressure dissipates. Similarly, the interest rate on 10-year Treasury notes rises from 2.8 percent in the first half of 2018 to a cyclical peak of nearly 4.0 percent in 2021 before falling slightly, back to 3.8 percent, by the end of 2022.

CBO's projections of long-term interest rates over the next few years reflect several factors. First, they incorporate the anticipated movements of short-term interest

11. In CBO's projections, payroll employment is slightly higher in 2020, reflecting an anticipated increase in the number of temporary workers hired by the Census Bureau to conduct the decennial census.

rates. Second, an increase in the term premium (the premium paid to bondholders for the extra risk associated with holding longer-term bonds), which has historically moved up and down with the business cycle, is projected to contribute to some of the rise in long-term rates. Finally, CBO expects the ongoing reduction in the Federal Reserve's portfolio of long-term assets to provide a slight boost to long-term interest rates. Despite that boost, however, CBO expects the difference between long-term and short-term rates (referred to as the yield curve slope) to flatten through 2022.

The Economic Outlook for 2023 to 2028

CBO's projections of GDP, unemployment, inflation, and interest rates for 2023 through 2028 are based mainly on the agency's projections of underlying trends in key variables, such as the size of the labor force, the number of hours worked, capital investment, and productivity. In addition, CBO considers the effects of current-law federal tax and spending policies on those variables. In some cases, policies might be projected not only to affect potential output but also to influence aggregate demand for goods and services, causing the gap between actual output and potential output to change. For example, the expiration of the temporary provisions in the 2017 tax act—including the expiration of most of the provisions affecting individual income taxes at the end of 2025 and the phaseout of bonus depreciation by the end of 2026—is projected to slow real GDP growth and to lower real GDP in relation to its potential in those years.

Potential Output and Actual Output

In CBO's projections, potential output grows at an average rate of 1.8 percent per year over the 2023–2028 period, driven by average annual growth of the potential labor force of about 0.4 percent and growth of potential labor force productivity of about 1.4 percent (see Table 2 and the bottom panel of Figure 1 on page 3). Compared with growth of potential output of about 2.0 percent per year from 2018 to 2022, the annual rate of 1.8 percent in later years represents a slowdown of about 0.2 percentage points, which results primarily from a projected slowdown in growth of the potential labor force.

The slowdown in growth is expected to be particularly marked in the nonfarm business sector, which produces roughly three-quarters of GDP. Annual growth of that sector's potential output slows by about a quarter of a percentage point in CBO's projections, from over 2.3 percent in the 2018–2022 period to less than 2.1 percent in the 2023–2028 period. The contribution of potential hours worked falls from 0.4 percentage points per year, on average, in the first half of the 11-year projection period to 0.2 percentage points in the second half, while the contribution of capital services drops from an average of 0.9 percentage points per year to 0.7 percentage points. The slowdown in the growth of potential hours and in the growth of capital services reflects changes in underlying long-run trends—such as the aging of the population and other demographic shifts—as well as the expiration of temporary tax provisions under current law.

Also, the annual rate of growth of potential total factor productivity (the average real output per unit of combined labor and capital services) in the nonfarm business sector accelerates in CBO's forecast from 1.0 percent in the first half of the projection period to 1.2 percent in the second half, somewhat offsetting the slowdown in the growth of factor inputs. That acceleration plays a key role in keeping growth in potential aggregate output substantially faster than the 1.5 percent average annual growth that is estimated to have occurred since 2007, when the last recession began.

Typically in CBO's forecasts, the growth of actual output and growth of potential output converge in the second half of the 11-year period, and the level of actual output stays about 0.5 percent below that of potential output, which is consistent with the long-term relationship between the two measures. In the agency's current forecast, however, that convergence is interrupted because the expiration of the temporary provisions of the 2017 tax act is expected not only to affect the growth of potential output by reducing the supply of labor but also to result in a temporary slowdown in the growth of aggregate demand. As a consequence, in the current forecast, the gap between actual output and potential output widens temporarily before returning to its long-term average in the final years of the projection period. The average growth rate of actual output during the 2023–2028 period is 1.7 percent per year, slightly less than the 1.8 percent average annual growth projected for potential output in those years.

The Labor Market

In CBO's projections, the unemployment rate settles by 2024 near its anticipated long-term rate of 4.8 percent

Table 2.

Key Inputs in CBO's Projections of Real Potential GDP

Percent

	Average Annual Growth							Projected Average Annual Growth		
	1950–1973	1974–1981	1982–1990	1991–2001	2002–2007	2008–2017	Total, 1950–2017	2018–2022	2023–2028	Total, 2018–2028
					Overall Economy					
Real Potential GDP	4.0	3.2	3.4	3.2	2.5	1.5	3.2	2.0	1.8	1.9
Potential Labor Force	1.6	2.5	1.7	1.2	1.0	0.5	1.4	0.6	0.4	0.5
Potential Labor Force Productivity[a]	2.4	0.7	1.7	2.0	1.5	0.9	1.7	1.4	1.4	1.4
					Nonfarm Business Sector					
Real Potential Output	4.1	3.5	3.6	3.6	2.7	1.7	3.4	2.3	2.1	2.2
Potential Hours Worked	1.4	2.3	1.8	1.2	0.4	0.5	1.3	0.6	0.3	0.4
Capital Services	3.7	3.8	3.6	3.8	2.9	1.8	3.4	2.5	2.0	2.3
Potential Total Factor Productivity	1.9	0.9	1.2	1.4	1.6	0.7	1.4	1.0	1.2	1.1
Contributions to the Growth of Real Potential Output (Percentage points)										
Potential hours worked	1.0	1.6	1.2	0.8	0.2	0.3	0.9	0.4	0.2	0.3
Capital input	1.1	1.2	1.2	1.3	1.0	0.7	1.1	0.9	0.7	0.8
Potential total factor productivity	1.9	0.9	1.2	1.4	1.6	0.7	1.4	1.0	1.2	1.1
Total Contributions	4.0	3.7	3.6	3.5	2.8	1.7	3.4	2.3	2.1	2.2
Potential Labor Productivity[b]	2.6	1.2	1.8	2.3	2.4	1.2	2.1	1.7	1.8	1.8

Source: Congressional Budget Office.

Real values are nominal values that have been adjusted to remove the effects of changes in prices. Potential GDP is CBO's estimate of the maximum sustainable output of the economy.

The table shows compound annual growth rates over the specified periods calculated using calendar year data.

GDP = gross domestic product.

a. The ratio of potential GDP to the potential labor force.

b. The ratio of potential output to potential hours worked in the nonfarm business sector.

(roughly one-quarter of a percentage point higher than the natural rate of 4.6 percent), though it rises again temporarily in 2026.[12] That temporary increase occurs because the slowdown in the growth of aggregate demand caused by the expiration of certain provisions of the 2017 tax act also slows the growth in the demand for labor. Meanwhile, the natural rate of unemployment declines very slowly (by a total of less than 0.1 percentage point) over the next decade. That slow decline reflects a shift in the composition of the workforce toward older workers, who tend to have lower rates of unemployment (when they participate in the labor force), and away from less educated workers, who tend to have higher rates.

The labor force participation rate follows its long-term trend in CBO's projections and falls to about 61 percent by 2028, roughly 1¼ percentage points below the agency's projection for 2023. The agency attributes most of the decline from 2023 to 2028 to demographic changes—in particular, to the aging of the population (because older people tend to participate less in the labor force than younger people do).

Growth in employment and wages is projected to moderate during the 2023–2028 period. In particular, nonfarm payroll employment increases by an average

12. The projected gap of 0.25 percentage points between the unemployment rate and the natural rate of unemployment corresponds to the projected output gap of -0.5 percent of potential output.

of 57,000 jobs per month during those years in CBO's forecast. Measured as a percentage of the population, employment falls from 59.4 percent in 2023 to 58.1 percent in 2028, reflecting the decline in the potential labor force participation rate. Real compensation per hour in the nonfarm business sector, a measure of labor costs that is a useful gauge of longer-term trends, grows at an average annual rate of 1.8 percent from 2023 to 2028—the same rate at which labor force productivity in that sector grows in the agency's projections, reflecting the close historical relationship between the two measures.

Inflation

In the agency's forecast, the overall and the core PCE price indexes increase by an average of 2.0 percent per year between 2023 and 2028, which is the Federal Reserve's long-run target for inflation. The overall and core CPI-U average 2.4 percent growth annually in those years. Those projections reflect the historical difference between the growth rates of the PCE price indexes and the CPI-U.

Interest Rates

Over the 2023–2028 period, the interest rate on 3-month Treasury bills averages 2.8 percent in CBO's projections, and the rate on 10-year Treasury notes, 3.7 percent. The federal funds rate averages 3.1 percent. Throughout that period, federal debt rises in relation to GDP and exerts upward pressure on short- and long-term interest rates. Long-term interest rates rise gradually in relation to short-term rates as the term premium slowly increases over the latter half of the 11-year projection period. Various factors—continued growth in foreign economies and inflation that remains at or near the Federal Reserve's target rate—are expected to make holding Treasury securities as a hedge against adverse foreign and domestic economic outcomes less desirable for investors than it has been in recent years, thereby putting upward pressure on the term premium.

In general, CBO expects interest rates to rise slightly over the 2023–2028 period. However, short-term interest rates decline slightly from mid-2025 through 2026 in the agency's forecast because the Federal Reserve is expected to reduce the federal funds rate in response to the slower growth stemming from the expiration of the individual income tax cuts.

Projections of Income for 2018 to 2028

Projections of federal revenues depend to a large extent on the amount of the various types of income earned in the production of GDP. The most important types of income for projecting federal revenues are wages and salaries and domestic profits, which are taxed at higher rates than the other types. Together, those two types of income have averaged just over 52 percent of GDP since the early 1980s, though their combined share of GDP has fluctuated with the business cycle. As of early 2018, the sum of those two types of income amounted to just under 52 percent of GDP. In the near term, as the economy operates above its potential, that percentage rises in CBO's forecast, but it settles back to its post-1983 average in later years.

In CBO's projections, wages and salaries grow more quickly than other kinds of income throughout the 11-year projection period, increasing from 43.2 percent of GDP in 2018 to 44.1 percent in 2028. That rise in wages and salaries relative to other types of income contributes to a partial rebound in labor's share of GDP, which grows from 57.1 percent in 2018 to 58.7 percent in 2028. Despite that projected growth, CBO does not expect labor's share of GDP to reach its 1980–2000 average of more than 59.2 percent because some of the long-run factors that have depressed labor's share since the early 2000s are likely to persist in the coming decade. One such factor is globalization, which has increased businesses' incentives to move the production of labor-intensive goods and services to countries with labor costs that are lower than those in the United States. Another factor is technological change, which may have increased returns to capital more than it has increased returns to labor.

The share of domestic corporate profits falls from 9.5 percent of GDP in 2018 to an average of 8.3 percent over the 2023–2028 period in CBO's forecast. The decline in the share of domestic profits mostly reflects the rise in wages and salaries, but it also reflects an increase in corporate interest payments that results from rising interest rates.

Some Uncertainties in the Economic Outlook

Economic projections are inherently uncertain. But CBO's current economic projections are especially so because they incorporate several estimates of the effects of recent changes to fiscal policy, which are themselves very uncertain. In addition, recently implemented

changes to trade policies, and proposals calling for further changes, compound the uncertainty surrounding the current economic outlook.

Trade Policy Changes

A sizable uncertainty in the U.S. trade and inflation forecast stems from recent changes to U.S. import tariffs and the retaliation of the country's key trading partners. The renegotiation of the North American Free Trade Agreement (NAFTA) similarly presents the risk that trade and inflation may differ from CBO's projections.

When CBO completed its current economic forecast, the agency estimated that the macroeconomic consequences of the U.S. tariffs and foreign retaliatory tariffs that had been implemented at that time would be small. The prices of washing machines, solar panels, steel, and aluminum increased in the first half of 2018, but those products account for only a small share of consumer and business purchases. Higher tariffs on more imported products, however, could add to inflationary pressure, which in turn would not only reduce the purchasing power of domestic income but also increase the costs of domestic production, making the prices of U.S. exports less competitive in international markets. In addition, retaliatory tariffs on U.S. exports are likely to reduce the profitability of U.S. businesses whose products are targeted by those tariffs.

Furthermore, heightened uncertainty about trade policy could discourage businesses from making capital investments that they might otherwise have made, because changes to trade policy affect price competitiveness in foreign markets as well as the costs associated with global supply chains. Recent volatility in equity markets might indicate that such uncertainty is already taking a toll on the value of U.S. businesses.

Other Uncertainties

In addition to trade policy changes, many other developments could cause economic growth and other variables to differ from CBO's projections over the near term. For example, if energy prices continued to rise or stayed elevated longer than CBO has projected, inflation would be higher, and if the adverse effects on consumer spending outweighed increased investment in oil drilling, GDP would be lower. Moreover, the 2017 tax act significantly altered the incentives to work and invest, but it is very difficult to anticipate how households and businesses will respond to those changes in incentives. If consumer spending and capital investment increased more (or less) than CBO projects, GDP growth and interest rates would be correspondingly higher (or lower).[13]

Over the long term, policy changes and other factors add to the uncertainty surrounding CBO's projections. The scheduled expiration of the provisions of the 2017 tax act is one source of uncertainty stemming from policy changes during the projection period. Individuals and businesses could respond more (or less) to those changes than CBO anticipates, resulting in lower (or higher) economic growth in the later years of the projection period than the agency forecasts. In addition to fiscal policy changes, recent shifts by the Administration and the Congress toward deregulation and a looser regulatory environment are expected to boost investment, and thus potential output, modestly in the long term. If the effects of deregulation are greater than CBO expects, however, then economic growth could be stronger than the agency projects.

Long-run economic growth could also be higher or lower than CBO projects for reasons unrelated to policy. If, for example, the labor force grew more quickly than expected—say, because older workers chose to stay in the labor force longer than anticipated—the economy could grow considerably more quickly than it does in CBO's projections. By contrast, if the growth of labor productivity did not rise above its average postrecession pace, as it does in CBO's projections, the growth of GDP might be weaker than the agency projects.

Over the next five or six years, CBO projects, the economy will experience a cycle in which the output gap widens and then narrows through slower (though still positive) economic growth—but there is nonetheless a risk of recession. Some analysts have noted with concern the recent narrowing of the spread between long-term and short-term interest rates. In the past, the economy has often entered a recession shortly after that spread has turned negative (a development referred to as an inversion of the yield curve). Consistent with the agency's forecast of slower economic growth in 2019 and 2020, that spread continues to close but does not invert in

13. For example, one provision of the 2017 tax act provided companies a greater incentive to fund their defined benefit pension plans in 2018. CBO estimates that the effect of that provision on interest rates will be small. If, however, the effect is larger than expected, interest rates will be higher than CBO projects in 2019 and beyond.

CBO's projections. There is some risk, however, that the yield curve could invert. Although an inversion would not by itself cause an economic downturn to occur, it could signal that market participants see an increased risk of recession.

Quantifying the Uncertainty in CBO's Projections

To quantify the degree of uncertainty in its projections for the next five years, CBO analyzed its past forecasts of the growth of real GDP and of inflation.[14] On the basis of that analysis, CBO estimates that there is approximately a two-thirds chance that the average annual growth rate of real GDP will be between 0.8 percent and 3.5 percent over the next five years. That is, there is a two-thirds chance that real GDP in 2022 will be within roughly $1.3 trillion of the projected value of $19 trillion (in 2009 dollars). Similarly, errors in CBO's past forecasts of inflation (as measured by the CPI-U) suggest that there is a roughly two-thirds chance that the average annual rate of inflation will fall between 1.8 percent and 3.0 percent over the next five years.

Changes in CBO's Economic Projections Since April

CBO's current economic projections differ in some important respects from those published in April 2018 (see Table 3).[15] In particular, CBO's current economic forecast incorporates the path for discretionary spending that was specified in the agency's most recent baseline budget projections, which were published as part of *An Analysis of the President's 2019 Budget*.[16] Federal spending in those projections is somewhat lower than the amounts used as the basis of CBO's previous economic projections, which were made before details of the Consolidated Appropriations Act, 2018, were finalized. Adjusting those economic projections to account for CBO's current spending projections resulted in reduced projections of real federal purchases and, in turn, lower projections of real GDP: By 2020, the level of real GDP in CBO's current forecast is about 0.3 percent lower than it was in the previous forecast because of that adjustment.

CBO has also revised down its projections of interest rates over the 2018–2023 period since April. It has done so to incorporate the current path for discretionary spending as well as to account for new data on financial markets and information from other forecasters. Incorporating the baseline spending path resulted in slower output growth in the near term and a slightly smaller output gap. On the basis of that smaller output gap, CBO projects that the Federal Reserve would raise interest rates fewer times and that short-term interest rates would be lower. Projections of long-term rates, which are based in part on the expected path of short-term rates, were revised down as well. Aligning those projections with CBO's current discretionary spending path also resulted in smaller deficits than those incorporated in CBO's previous economic forecast. More national saving stemming from those smaller deficits also contributed to the downward revision in interest rates. In addition, data on financial markets and information from other forecasters point to a more muted increase in interest rates in the near term than CBO forecast in April. (The agency's projections of interest rates for 2025 to 2028 are the same as they were in April.)

Other changes made to CBO's forecast since April are relatively modest and arise primarily from recent developments. For example, CBO now expects inflation (as measured by both the overall PCE and the core PCE price indexes) to reach and surpass the Federal Reserve's target of 2.0 percent in 2018 rather than in 2019 as previously projected. That upward revision mainly reflects stronger than expected growth in energy prices and, to a lesser extent, health care prices.

Comparison With Other Economic Projections

In the near term, CBO anticipates a slightly stronger economy than do most of the private-sector economists whose forecasts were published in the July 2018 *Blue Chip Economic Indicators*. In particular, CBO's projections for both 2018 and 2019 are near the top of the middle two-thirds of the ranges of *Blue Chip* forecasts of real GDP growth, interest rates, and consumer price inflation and near the bottom of the middle two-thirds of the range of forecasts of the unemployment rate (see Figure 2).

Compared with the forecasts made by Federal Reserve officials and reported at the June 2018 meeting of the Federal Open Market Committee, CBO's projections

14. See Congressional Budget Office, *CBO's Economic Forecasting Record: 2017 Update* (October 2017), www.cbo.gov/publication/53090.

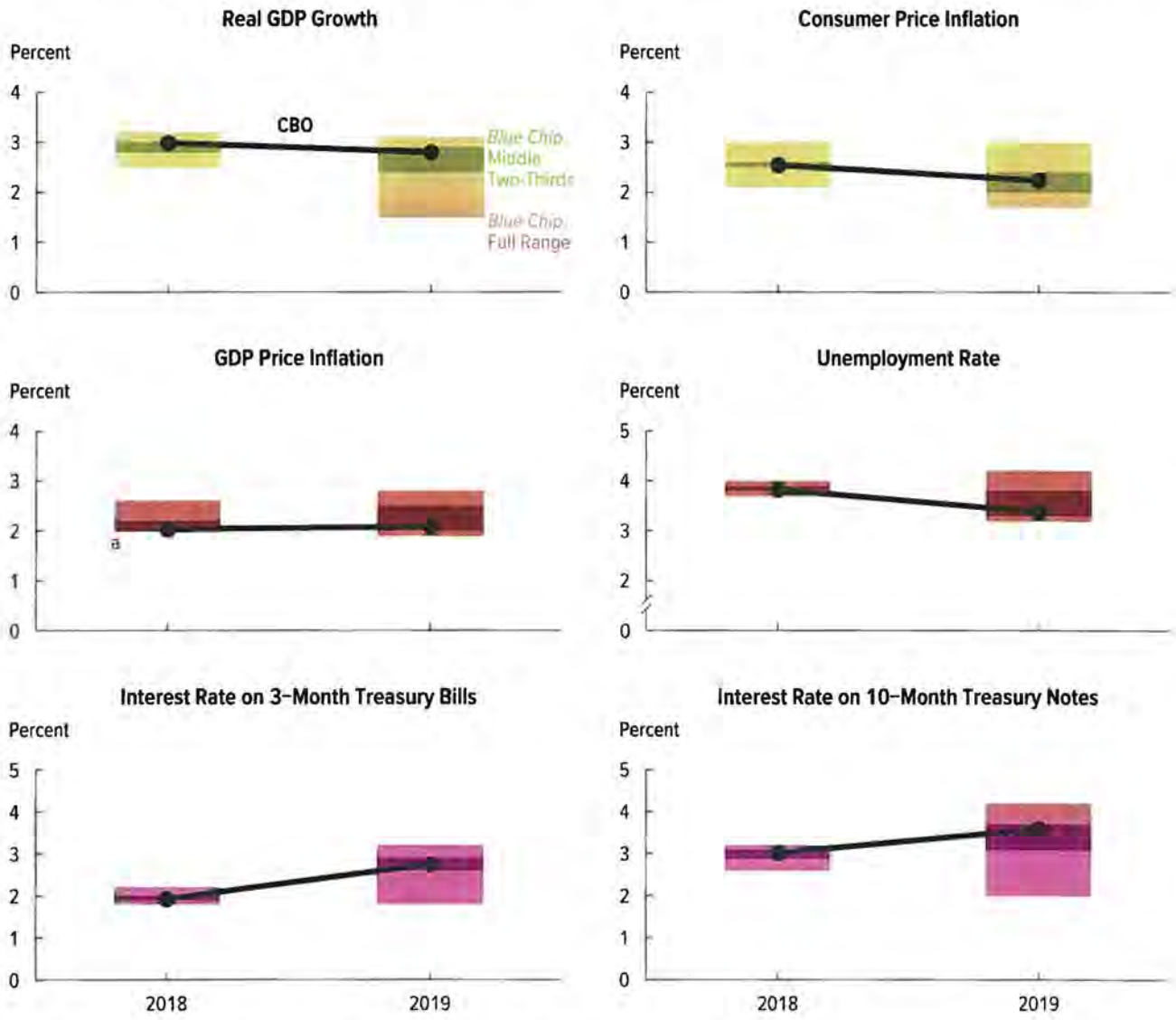
15. See Congressional Budget Office, *The Budget and Economic Outlook: 2018 to 2028* (April 2018), www.cbo.gov/publication/53651.

16. See Congressional Budget Office, *An Analysis of the President's 2019 Budget* (May 2018), www.cbo.gov/publication/53884.

Figure 2.

Comparison of CBO's Economic Projections With Those From the *Blue Chip* Survey

In the near term, CBO anticipates a somewhat stronger economy than do most of the private-sector economists whose forecasts are published in *Blue Chip Economic Indicators*.



Sources: Congressional Budget Office; Wolters Kluwer, *Blue Chip Economic Indicators* (July 10, 2018).

The full range of forecasts from the *Blue Chip* survey is based on the highest and lowest of the roughly 50 forecasts. The middle two-thirds of that range omits the top one-sixth and the bottom one-sixth of the forecasts.

Real values are nominal values that have been adjusted to remove the effects of changes in prices. Consumer price inflation is calculated using the consumer price index for all urban consumers. Real GDP growth and inflation rates are measured from the average of one calendar year to the next.

The unemployment rate is the number of jobless people who are available for and seeking work, expressed as a percentage of the labor force. The unemployment rate and interest rates are calendar year averages.

GDP = gross domestic product.

a. The lower ends of the full range and the middle two-thirds are equal.

Table 3.

Comparison of CBO's Current and Previous Economic Projections for Calendar Years 2018 to 2028

				Annual Average		
	2018	2019	2020	2018–2022	2023–2028	Total, 2018–2028
	Percentage Change From Fourth Quarter to Fourth Quarter					
Real GDP[a]						
August 2018	3.1	2.4	1.7	2.1	1.7	1.9
April 2018	3.3	2.4	1.8	2.1	1.7	1.9
Nominal GDP						
August 2018	5.1	4.7	3.9	4.2	3.9	4.0
April 2018	5.2	4.5	3.9	4.2	3.9	4.0
PCE Price Index						
August 2018	2.2	2.0	2.1	2.1	2.0	2.0
April 2018	1.8	2.0	2.1	2.0	2.0	2.0
Core PCE Price Index[b]						
August 2018	2.1	2.1	2.2	2.1	2.0	2.0
April 2018	1.9	2.1	2.2	2.1	2.0	2.0
Consumer Price Index[c]						
August 2018	2.5	2.3	2.5	2.5	2.4	2.4
April 2018	2.0	2.3	2.5	2.4	2.4	2.4
Core Consumer Price Index[b]						
August 2018	2.3	2.6	2.7	2.5	2.4	2.4
April 2018	2.3	2.5	2.6	2.5	2.4	2.4
GDP Price Index						
August 2018	2.0	2.2	2.2	2.1	2.1	2.1
April 2018	1.8	2.1	2.1	2.1	2.1	2.1
Employment Cost Index[d]						
August 2018	3.4	3.6	3.6	3.5	3.1	3.3
April 2018	3.1	3.6	3.6	3.4	3.2	3.3
Real Potential GDP[a]						
August 2018	2.0	2.1	2.1	2.0	1.8	1.9
April 2018	2.0	2.1	2.1	2.0	1.8	1.9

Continued

suggest a stronger economic outlook for 2018, a similar outlook for 2019, and a weaker outlook for 2020 and the longer term (see Figure 3).[17] The Federal Reserve reports three sets of forecasts: a median, a range, and a central tendency. The range is based on the highest and lowest forecasts made by the members of the Board of Governors of the Federal Reserve System and the presidents of the Federal Reserve Banks; the central tendency is the range formed by removing the three highest and three lowest projections. For 2018, CBO's projections of real GDP growth, interest rates, and inflation are either above or near the top of the full range of Federal Reserve forecasts, and its projection of the unemployment rate is near the bottom of the full range. For 2019, by contrast, the agency's projections of real GDP growth, interest rates, inflation, and unemployment are largely within the central tendency, whereas for 2020 and the longer term, CBO's projections are somewhat weaker than those of Federal Reserve officials.

17. Board of Governors of the Federal Reserve System, "Economic Projections of Federal Reserve Board Members and Federal Reserve Bank Presidents Under Their Individual Assessments of Projected Appropriate Monetary Policy, June 2018" (June 13, 2018), https://go.usa.gov/xUNqg (PDF, 119 KB).

Table 3. Continued

Comparison of CBO's Current and Previous Economic Projections for Calendar Years 2018 to 2028

				Annual Average		
	2018	2019	2020	2018–2022	2023–2028	Total, 2018–2028
				Annual Average		
Unemployment Rate (Percent)						
August 2018	3.8	3.4	3.6	3.9	4.8	4.4
April 2018	3.8	3.3	3.6	3.9	4.8	4.4
Interest Rates (Percent)						
Three-month Treasury bills						
August 2018	1.9	2.8	3.1	2.9	2.8	2.8
April 2018	1.9	2.9	3.6	3.1	2.8	3.0
Ten-year Treasury notes						
August 2018	3.0	3.6	3.9	3.7	3.7	3.7
April 2018	3.0	3.7	4.1	3.8	3.7	3.8
Tax Bases (Percentage of GDP)						
Wages and salaries						
August 2018	43.1	43.4	43.7	43.6	44.1	43.9
April 2018	43.2	43.5	43.9	43.7	44.3	44.0
Domestic corporate profits[e]						
August 2018	9.5	9.6	9.1	9.1	8.3	8.7
April 2018	9.5	9.6	9.0	9.0	8.0	8.5

Sources: Congressional Budget Office; Bureau of Labor Statistics; Federal Reserve.

GDP = gross domestic product; PCE = personal consumption expenditures.

a. Real values are nominal values that have been adjusted to remove the effects of changes in prices.

b. Excludes prices for food and energy.

c. The consumer price index for all urban consumers.

d. The employment cost index for wages and salaries of workers in private industry.

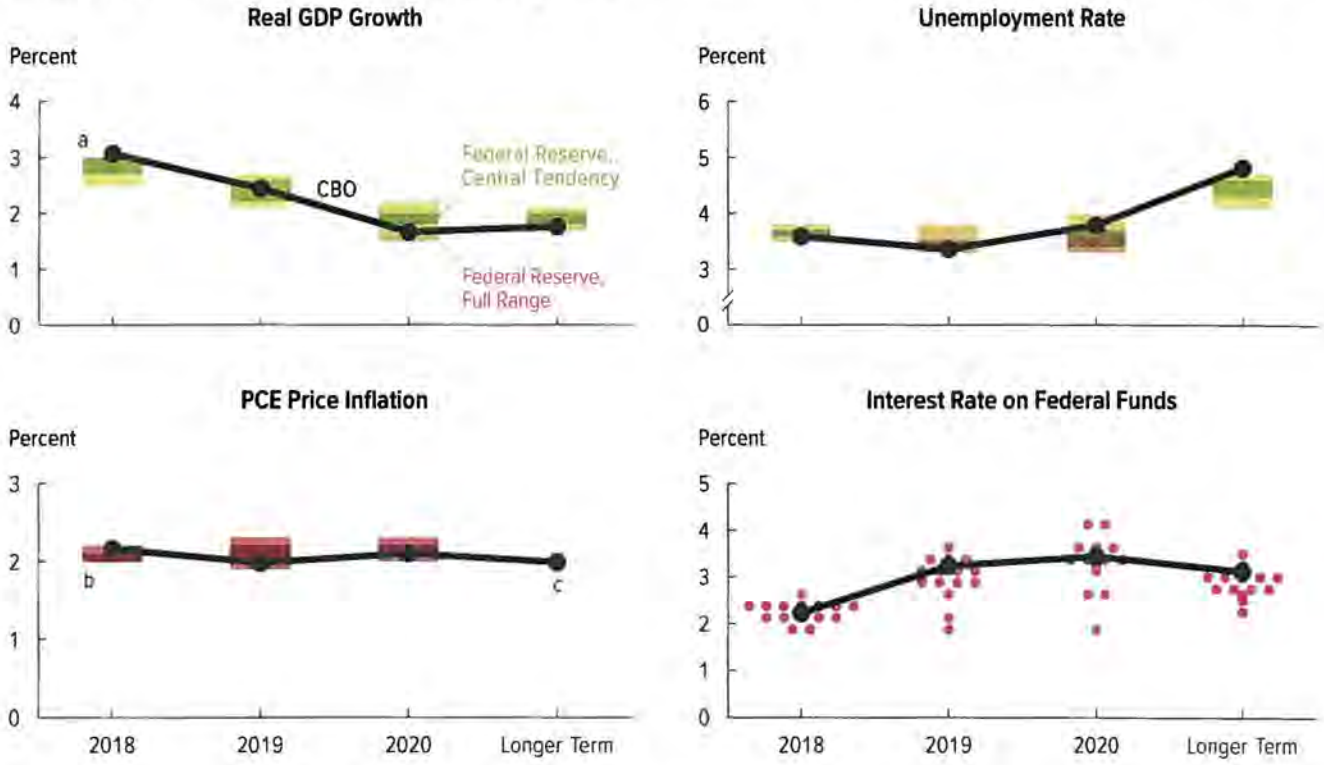
e. Consists of domestic profits, adjusted to remove distortions in depreciation allowances caused by tax rules and to exclude the effects of inflation on the value of inventories.

At least part of the discrepancies between CBO's projections and other forecasters' is probably attributable to differences in the economic data available when the forecasts were completed and to differences in the economic and statistical models used to prepare them. In addition, other forecasters may be assuming certain changes in federal policies will occur, whereas CBO's projections are based on current law.

Figure 3.

Comparison of CBO's Economic Projections With Those by Federal Reserve Officials

Compared with forecasts made by Federal Reserve officials, CBO's projections suggest a stronger economic outlook for 2018, a similar outlook for 2019, and a somewhat weaker outlook for 2020 and the longer term.



Sources: Congressional Budget Office; Board of Governors of the Federal Reserve System, "Economic Projections of Federal Reserve Board Members and Federal Reserve Bank Presidents Under Their Individual Assessments of Projected Appropriate Monetary Policy, June 2018" (June 13, 2018), https://go.usa.gov/xUNqg (PDF, 119 KB).

The full range of forecasts from the Federal Reserve is based on the highest and lowest of the 15 projections by the Board of Governors and the presidents of the Federal Reserve Banks. (One Federal Reserve official did not submit longer-run projections for the change in real GDP, the unemployment rate, or the federal funds rate.) The central tendency is the range formed by removing the 3 highest and 3 lowest projections—roughly speaking, the middle two-thirds of the full range.

Each of the data points for the federal funds rate represents a forecast made by one of the members of the Federal Reserve Board or one of the presidents of the Federal Reserve Banks in June 2018. The Federal Reserve officials' forecasts of the federal funds rate are for the rate at the end of the year, whereas CBO's forecasts are fourth-quarter values.

For CBO, longer-term projections are values for 2028. For the Federal Reserve, longer-term projections are described as the value at which each variable would settle under appropriate monetary policy and in the absence of further shocks to the economy.

Real values are nominal values that have been adjusted to remove the effects of changes in prices.

The unemployment rate is the number of jobless people who are available for and seeking work, expressed as a percentage of the labor force.

The core PCE price index excludes prices for food and energy.

Real GDP growth and inflation rates are measured from the fourth quarter of one calendar year to the fourth quarter of the next. The unemployment rate is a fourth-quarter value.

GDP = gross domestic product; PCE = personal consumption expenditures.

a. The upper ends of the full range and central tendency are equal.

b. The lower ends of the full range and central tendency are equal.

c. For PCE price inflation in the longer term, the range and central tendency equal 2 percent.

Appendix: CBO's Economic Projections for 2018 to 2028

The tables in this appendix expand on the information in the main report by showing the Congressional Budget Office's economic projections for each year from 2018 to 2028 (by calendar year in Table A-1 and by fiscal year in Table A-2). CBO's projections for 2018 to 2022 reflect the economy's strong initial momentum as well as significant fiscal stimulus in those years. They also reflect a modest increase in the growth of potential output—the economy's maximum sustainable level of production.

The projections for 2023 to 2028 are primarily based on underlying trends for those years in key variables that determine the growth of potential output, such as the size of the labor force, the number of hours worked, capital investment, and productivity. For 2025 and 2026, however, CBO projects a modest temporary slowdown in the growth of actual output that results from fiscal policy under current law.

Table A-1.

CBO's Economic Projections, by Calendar Year

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
						Percentage Change From Year to Year					
Gross Domestic Product											
Real[a]	3.0	2.8	1.9	1.6	1.6	1.6	1.7	1.8	1.6	1.8	1.8
Nominal	5.1	4.9	4.1	3.8	3.8	3.8	3.9	3.9	3.8	3.9	3.9
Inflation											
PCE price index	2.1	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0
Core PCE price index[b]	1.9	2.1	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0
Consumer price index[c]	2.5	2.2	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4
Core consumer price index[b]	2.2	2.4	2.7	2.7	2.5	2.4	2.4	2.3	2.3	2.3	2.4
GDP price index	2.0	2.1	2.2	2.2	2.1	2.2	2.2	2.1	2.1	2.1	2.1
Employment Cost Index[d]	3.1	3.4	3.6	3.6	3.4	3.2	3.1	3.1	3.0	3.0	3.0
						Calendar Year Average					
Unemployment Rate (Percent)	3.8	3.4	3.6	4.1	4.6	4.7	4.8	4.8	4.9	4.9	4.8
Payroll Employment (Monthly change, in thousands)[e]	210	178	63	23	28	41	53	62	56	66	67
Interest Rates (Percent)											
Three-month Treasury bills	1.9	2.8	3.1	3.2	3.2	3.0	2.8	2.7	2.7	2.8	2.8
Ten-year Treasury notes	3.0	3.6	3.9	4.0	3.9	3.8	3.7	3.7	3.7	3.7	3.7
Tax Bases (Percentage of GDP)											
Wages and salaries	43.1	43.4	43.7	43.9	44.0	44.0	44.0	44.1	44.1	44.1	44.1
Domestic economic profits	9.5	9.6	9.1	8.7	8.5	8.3	8.3	8.3	8.3	8.4	8.4
Tax Bases (Billions of dollars)											
Wages and salaries	8,785	9,288	9,740	10,145	10,548	10,962	11,391	11,842	12,303	12,789	13,295
Domestic economic profits[f]	1,928	2,055	2,026	2,013	2,027	2,066	2,146	2,240	2,318	2,426	2,534
Nominal GDP (Billions of dollars)	20,377	21,383	22,269	23,110	23,977	24,896	25,869	26,882	27,898	28,989	30,121

Source: Congressional Budget Office.

GDP = gross domestic product; PCE = personal consumption expenditures.

a. Real values are nominal values that have been adjusted to remove the effects of changes in prices.

b. Excludes prices for food and energy.

c. The consumer price index for all urban consumers.

d. The employment cost index for wages and salaries of workers in private industry.

e. The average monthly change, calculated by dividing by 12 the change in payroll employment from the fourth quarter of one calendar year to the fourth quarter of the next.

f. Consists of domestic profits, adjusted to remove distortions in depreciation allowances caused by tax rules and to exclude the effects of inflation on the value of inventories.

Table A-2.

CBO's Economic Projections, by Fiscal Year

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
					Percentage Change From Year to Year						
Gross Domestic Product											
Real[a]	2.9	3.0	2.1	1.6	1.6	1.6	1.7	1.8	1.7	1.7	1.8
Nominal	4.9	5.1	4.3	3.8	3.7	3.8	3.9	3.9	3.8	3.9	3.9
Inflation											
PCE price index	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0
Core PCE price index[b]	1.8	2.1	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0
Consumer price index[c]	2.4	2.3	2.4	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4
Core consumer price index[b]	2.0	2.3	2.7	2.7	2.6	2.4	2.4	2.3	2.3	2.3	2.4
GDP price index	2.0	2.0	2.2	2.2	2.1	2.2	2.2	2.1	2.1	2.1	2.1
Employment Cost Index[d]	3.0	3.4	3.6	3.6	3.4	3.3	3.2	3.1	3.0	3.0	3.0
					Fiscal Year Average						
Unemployment Rate (Percent)	4.0	3.4	3.5	4.0	4.5	4.7	4.8	4.8	4.9	4.9	4.8
Payroll Employment (Monthly change, in thousands)[e]	199	202	89	25	26	38	50	60	57	65	67
Interest Rates (Percent)											
Three-month Treasury bills	1.7	2.6	3.1	3.2	3.2	3.1	2.9	2.7	2.7	2.8	2.8
Ten-year Treasury notes	2.8	3.5	3.8	4.0	3.9	3.8	3.7	3.7	3.7	3.7	3.7
Tax Bases (Percentage of GDP)											
Wages and salaries	43.1	43.4	43.7	43.9	44.0	44.0	44.0	44.0	44.1	44.1	44.1
Domestic economic profits	9.3	9.7	9.2	8.8	8.5	8.3	8.3	8.3	8.3	8.3	8.4
Tax Bases (Billions of dollars)											
Wages and salaries	8,665	9,165	9,634	10,045	10,447	10,857	11,282	11,728	12,187	12,665	13,167
Domestic economic profits[f]	1,866	2,045	2,037	2,013	2,022	2,052	2,123	2,220	2,296	2,396	2,508
Nominal GDP (Billions of dollars)	20,122	21,141	22,059	22,899	23,756	24,660	25,621	26,629	27,639	28,709	29,837

Source: Congressional Budget Office.

GDP = gross domestic product; PCE = personal consumption expenditures.

a. Real values are nominal values that have been adjusted to remove the effects of changes in prices.

b. Excludes prices for food and energy.

c. The consumer price index for all urban consumers.

d. The employment cost index for wages and salaries of workers in private industry.

e. The average monthly change, calculated by dividing by 12 the change in payroll employment from the fourth quarter of one calendar year to the fourth quarter of the next.

f. Consists of domestic profits, adjusted to remove distortions in depreciation allowances caused by tax rules and to exclude the effects of inflation on the value of inventories.

List of Tables and Figures

Tables

Figures

About This Document

This document is one of a series of reports on the state of the economy that the Congressional Budget Office issues each year. In keeping with CBO's mandate to provide objective, impartial analysis, this report makes no recommendations.

CBO's Panel of Economic Advisers commented on an early version of the economic forecast underlying this report. Members of the panel are Katharine Abraham, Alan Auerbach, David Autor, Olivier Blanchard, Markus Brunnermeier, Mary Daly, Steven Davis, Kathryn Dominguez, Robert Hall, Jan Hatzius, Donald Kohn, Nellie Liang, Gregory Mankiw, Emi Nakamura, Jonathan Parker, Adam Posen, James Poterba, Valerie Ramey, Brian Sack, Robert Shimer, James Stock, Kevin Warsh, and Mark Zandi. Seth Carpenter, Peter Henry, and Melissa Kearney attended the panel's meeting as guests. Although CBO's outside advisers provided considerable assistance, they are not responsible for the contents of this report.

Y. Gloria Chen wrote this report with guidance from Robert Arnold, John Kitchen, Kim Kowalewski, and Jeffrey Werling. The economic forecast was prepared by David Burk, Y. Gloria Chen, Michael Falkenheim, Daniel Fried, Edward Gamber, Ronald Gecan, Mark Lasky, Jeffrey Perry, John Seliski, Robert Shackleton, Claire Sleigh, Jazmine Smith, Adam Staveski, and Christopher Williams.

Wendy Edelberg, Mark Hadley, Jeffrey Kling, and Robert Sunshine reviewed the report, Bo Peery edited it, and Casey Labrack prepared it for publication. The report is available on CBO's website (www.cbo.gov/publication/54318).

Keith Hall
Director
August 2018

Geographic Guide

Economic and Employment Projections

Projections data have a 10 year time horizon, unless otherwise noted. Data is not available for intervening consecutive years.

Clicking on a 'More' button below will show you the most frequently used links for topical geographic data.

	International	National	Region	Division	State	Metropolitan Area	County	C... To
Aggregate Economy		More »						
Industry Output		More »						
Employment by Industry		More »						
Employment by Occupation		More »			More »			
Labor Force		More »						

MOODY'S
INVESTORS SERVICE

CREDIT OPINION
5 March 2019

Update

Rate this Research

RATINGS

Duke Energy Corporation

Domicile	Charlotte, North Carolina, United States
Long Term Rating	Baa1
Type	LT Issuer Rating - Dom Curr
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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Duke Energy Corporation

Update to credit analysis

Summary

Duke Energy Corporation (Duke) is one of the largest utility holding companies in the US. Its credit profile reflects the company's diverse, low business risk operations in which about 97% of earnings and cash flow are derived from rate regulated businesses in strong economies with supportive regulators. These credit supportive factors are balanced against financial metrics that we expect will improve in 2019, but remain weak for the company's credit quality.

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

[1] CFO Pre-WC is defined as cash flow from operations excluding changes in working capital
Source: Moody's Financial Metrics

Credit strengths

» Diverse group of utilities operating in seven states in three geographic regions

» Credit supportive regulatory relationships

» Businesses are essentially all regulated or contracted

» Recovery of coal ash expenditures has generally been resolved

Credit challenges

» Weak consolidated credit metrics due primarily to:

» Significant capital spending for utility growth and modernization as well as other investments, including the delayed Atlantic Coast pipeline

» Lag in the recovery of storm related costs and coal ash spending will maintain pressure on credit metrics

» Relatively high parent company debt levels

Rating outlook

The stable outlook reflects our expectation that Duke will maintain supportive regulatory relationships in all of its jurisdictions. The outlook also assumes management will manage its operating, capital and financing plans in a manner that supports credit quality and enables the maintenance of credit metrics that are consistent with our expectations. For example, we currently anticipate the company's ratio of cash flow from operations excluding working capital (CFO pre-WC) to debt will improve to the 15% range.

Factors that could lead to an upgrade

» Although not likely in the near term, upward pressure on ratings could develop if regulatory environments were to become more supportive, leading to increased cash flow

» If there were to be reductions in leverage leading to materially stronger credit metrics

» Longer term, a ratio of CFO pre-WC to debt above 18% could lead to an upgrade

Factors that could lead to a downgrade

» A deterioration in the credit supportiveness of regulatory relationships, which could result in a reduction in cash flow

» A material increase in operating or capital expenditures that is not able to be recovered on a timely basis

» An increase in leverage leading to weaker credit metrics for example, CFO pre-WC remaining below 15% could put downward pressure on the ratings

» Parent company debt levels above 35% of total Moody's adjusted consolidated debt for an extended period

Key indicators

Exhibit 2
Duke Energy Corporation [1]

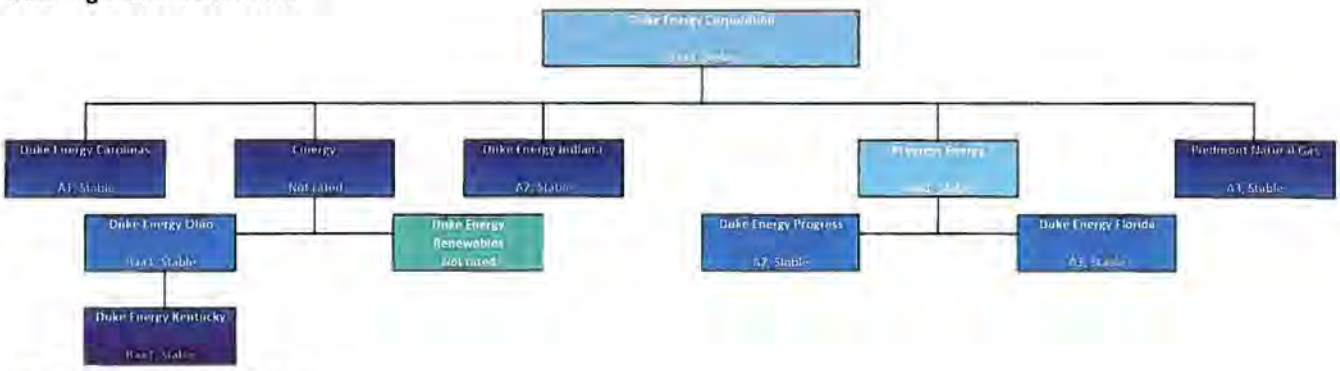
	Dec-14	Dec-15	Dec-16	Dec-17	Dec-18
CFO Pre-W/C + Interest / Interest	5.7x	5.3x	4.7x	4.7x	4.4x
CFO Pre-W/C / Debt	19.0%	17.3%	14.6%	14.8%	13.7%
CFO Pre-W/C – Dividends / Debt	13.4%	11.8%	9.9%	10.3%	9.4%
Debt / Capitalization	43.1%	44.2%	47.5%	53.0%	52.9%

[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

Duke is a large (2018 revenues of $24.5 billion), diversified energy company with mostly regulated utility operations headquartered in Charlotte, North Carolina. Its main business consists of its electric utilities and infrastructure business segment, which serves approximately 7.7 million retail electric customers in six US states and made up about 90% of Duke's 2018 earnings base. The company's gas utilities and infrastructure businesses provide natural gas to over 1.6 million customers located in five states. Duke has also formed a joint venture to build and own a 47% share of the estimated $7.0-$7.8 billion Atlantic Coast Pipeline, a 600-mile interstate natural gas pipeline from West Virginia to the Carolinas which has been experiencing permitting delays and increased costs. The company's relatively small (about 3% of 2018 adjusted earnings) commercial renewables business segment builds, develops and operates wind and solar generation projects throughout the continental US.

Exhibit 3
Duke Organizational Structure



Source: Moody's Investors Service, Company

Detailed credit considerations

Diverse group of utilities operating in credit supportive regulatory environments

Duke's overall credit profile is driven by seven regulated utilities operating in seven US states, which provide a high degree of regulatory and geographic diversity. We consider these regulatory jurisdictions to be supportive with rate settlements in place at most of its utilities. In addition, the company has achieved reasonably credit supportive outcomes in its major jurisdictions on issues related to coal ash remediation and federal tax reform.

In Duke's largest electric jurisdiction, North Carolina, the North Carolina Utilities Commission (NCUC) issued orders in 2018 for both Duke Energy Carolinas and Duke Energy Progress (combined approximately 56% of Duke's 2018 regulated earnings base) that established revenues based on a 9.9% return on equity, and a 52% equity base. The orders followed settlement agreements on traditional rate making parameters. We view the ability to regularly settle on more traditional issues as a credit positive.

The North Carolina orders also resolved issues relating to the recovery of costs for coal ash remediation. Spending for coal ash remediation has been deemed reasonable and prudent and, with the exception of a specific manageable penalty assessed in each case, the companies have been authorized to recover their prior expenditures over five years with a full debt and equity return. Ongoing expenditures will continued to be deferred for future recovery. In South Carolina, Duke Energy Progress previously received authorization to recover coal ash remediation costs over fifteen years with a full return, and is now requesting recovery over five years – similar to North Carolina. We view the ability to earn a full return on these expenditures, and to recover them over reasonable time frames, as credit positive. As a result of this rate base like treatment, we currently view the spending for coal ash remediation to be akin to a capital expenditure.

Duke Energy Carolinas' North Carolina order also addressed the impact of federal tax reform. The company's revenue requirement was reduced by the full amount of the change in tax rate to 21% from 35%. However, the company has been allowed to retain all excess deferred taxes for three years, or until its next rate case, whichever is sooner. At that time, the NCUC will evaluate how to best return this value to customers. We believe the form of return could include accelerated recovery of certain expenses, or the avoidance of rate increases. We would view these outcomes as credit positive, and we believe the decision will likely set a precedent for similar treatment at Duke Energy Progress.

The NCUC did however deny Duke's requests for rider recovery for grid modernization investments and ongoing coal ash remediation. As a result, there will continue to be regulatory lag associated with these expenditures and we expect the utilities will file frequent rate cases to minimize this exposure. Our stable outlook assumes a continuation of regulatory outcomes that will allow the companies to maintain cash flow based credit metrics at levels that are supportive of their current credit quality.

In South Carolina, as part of its November 2018 rate case filings, Duke Energy Carolinas and Duke Energy Progress have requested rate increases in the amounts of $168 million and $59 million respectively (each approximately 10%) premised on equity returns of 10.5% and a 53% equity component. The requested increases are driven primarily by major capital investments and coal ash remediation spending and are offset by the changes in state and federal tax rates. In Duke Energy Carolina's case, the South Carolina Office of

Regulatory Staff (ORS), which now acts as a consumer advocate, in late February recommended an increase of $77 million premised on a 9.3% ROE.

In the case of coal ash remediation in South Carolina, in 2016, the PSCSC issued accounting orders allowing the deferral of certain ash basin closure costs and the ability to net some of these expenses against regulatory liabilities accrued as a result of customer collections for future nuclear decommissioning and/or ash basin closure costs. Expenses not offset by existing liabilities are allowed to be deferred for future recovery. In Duke Energy Progress last rate case, the PSCSC authorized the recovery of deferred coal ash remediation costs over a 15 year period with a full return. In their current cases, both Duke Energy Progress and Duke Energy Carolinas are requesting the recovery period be shortened to five years, which would align with approvals in North Carolina.

In Florida (approximately 18% of 2018 regulated earnings base), as part of a 2017 second revised and restated settlement agreement (which amended a 2013 settlement agreement), Duke Energy Florida will increase base rates by an incremental $67 million each year from 2019 through 2021, subject to an ROE range of 9.5% to 11.5%. The updated order also included provisions that addressed the expected passage of federal tax reform and included the ability to use a portion of future benefits resulting from lower tax rates to accelerate the depreciation of existing coal plants rather than decreasing revenue. In January 2018, the Florida Public Service Commission authorized Duke Energy Florida to utilize the remainder of the benefits of lower tax rates to avoid a rate increase for power restoration costs associated with the company's 2017 response to Hurricane Irma. We view these tax reform related developments as supportive of credit quality.

Duke Energy Florida also continues to benefit from a credit positive Generation Base Rate Adjustment (GBRA) mechanism for new generation built or purchased during 2016-2018 that allows recovery of prudently incurred costs through a base rate adjustment when the generation is placed in service. Duke Florida's 1,640 MW $1.5 billion Citrus County combined cycle plant was placed into service in 2018. The 2017 settlement included a similar mechanism for up to 700MW of new solar generation to be acquired or constructed between 2018 and 2022.

In Indiana (about 11% of 2018 regulated earnings base), in June 2016, the Indiana Utility Regulatory Commission (IURC) approved a settlement agreement between Duke Energy Indiana and key consumer groups on a seven year $1.4 billion grid modernization plan. As a result, in accordance with previously approved state legislation, 80% of the plan's costs will be recovered through a rate rider, with the remaining 20% recoverable through future base rate proceedings. In May 2017, Duke Energy Indiana received approval to recover 60% of the capital and 80% of the operating costs of complying with the US Environmental Protection Agency's Coal Combustion Residuals rules via an environmental mandate tracker, and to defer the remaining difference for recovery in the utility's next rate case. In June 2018, Duke Energy Indiana reached a settlement with key intervenors on tax reform. The settlement calls for a flow through of the reduction in tax rate to 21% from 35% beginning in September. However, the protected portion of excess deferred taxes will be retained until January 2020, after which it will be returned over approximately 26 years. The unprotected portion will be returned over 10 years, but to mitigate the impact on cash flow based credit metrics, the amount is lower in the first five years. Duke Energy Indiana expect to file for its next general rate case in 2019.

Operations are essentially all regulated

In 2015, Duke successfully exited the merchant generating business with the sale of Duke Energy Ohio's competitive generating assets. In 2016, Duke sold its more volatile Latin American businesses and acquired Piedmont Natural Gas Company (Piedmont), expanding its relatively low risk local natural gas distribution operations in the historically credit supportive states of North Carolina, South Carolina and Tennessee. As a result, essentially all of its operations are now either state or federally regulated. Duke's commercial renewables segment provides services under long term contracts, and contributed under 5% of the company's 2018 earnings. The shift to lower business risk operations has helped to mitigate the decline in credit metrics that followed the Piedmont acquisition.

Exhibit 4
2018 Regulated Utilities Earnings Base

Source: Company

Consolidated credit metrics are weak

Duke's revenues and cash flow are being negatively impacted by the 2017 Tax Cuts and Jobs Act (TCJA), continued lag in recovery of ash disposal costs, severe storm activity, and lag in recovery of grid modernization investments. As a result, cash flow based credit metrics, which declined in 2016 following Duke's acquisition of Piedmont, remained depressed through 2018. For example, for the year ended December 31, 2018, we calculate Duke's ratio of cash flow from operations excluding changes in working capital (CFO pre-WC) to debt to be about 13.7%, which is at the lower end of the "Baa" scoring range for this metric in our rating methodology for regulated electric and gas utilities.

To support its balance sheet in view of these lower cash flows, Duke issued approximately $2 billion of equity in 2018 and plans to issue an additional approximately $500 million annually through at least 2022. Although the company continued to experience solid growth in its service territories, and was able to control normal operating and maintenance expenses, it has been hit with major storms in each of the past three years.

In 2018, a succession of unusually severe storms resulted in approximately $1.2 billion of unplanned costs across Duke's territories in the Carolinas and Florida, contributing to a 2018 consolidated CFO pre-WC to debt metric about 0.2% lower than anticipated. The impact on Duke's consolidated credit metrics was significantly moderated by the company's scale, its ability to contain costs, and otherwise favorable weather conditions.

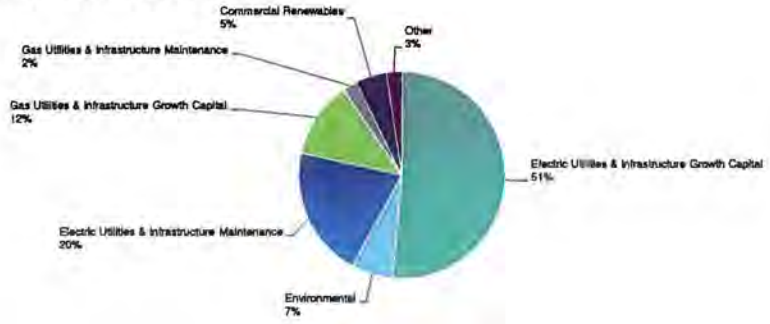
Going forward, we expect the lag in recovery of storm costs, coal ash spending, and grid modernization investments along with a delay in completion of the Atlantic Coast Pipeline will maintain pressure on credit metrics. While we anticipate Duke's ratio of CFO pre-WC will be around 15% in 2019, we believe it could move toward 14% in 2020 before rebounding as a result of rate activity. We note that in addition to planning regular rate cases in the Carolinas, Duke is also actively seeking legislation to allow rider recovery for its grid modernization investments which would reduce the assumed lag in recovery, and would be credit positive.

High capital spending for utility infrastructure and growth initiatives

In 2018, the company lowered its five year capital expenditures plans by $1 billion as part of its efforts to strengthen cash flow metrics. However, in its most recent five year plan, capital expenditures have risen by about $2 billion driven by a significant increase in maintenance capital needed for grid resiliency, particularly in light of recent storm activity.

Capital expenditures at Duke, inclusive of spending for coal ash remediation, have steadily increased year over year, nearly doubling from about $5.5 billion in 2014 to about $10.1 billion in 2018. As shown in the exhibit below, the largest portion of the plan represents what Duke terms "growth" capital driven by grid modernization in the Carolinas and natural gas infrastructure. In 2018, maintenance spending increased to $3.2 billion due in part to remediation efforts related to storm damages; going forward maintenance spending is expected to range between $2 and $2.5 billion per year.

Exhibit 5
2019-2023 Capital Expenditures Forecast ($50 billion)



Source: Company

In addition to its core utility investment, Duke is growing its natural gas pipeline businesses and plans to continue to selectively invest in renewables. Included in the company's capital plan for 2019-2023 is about $2.9 billion for midstream pipelines, primarily the Atlantic Coast Pipeline (ACP), and about $2.5 billion for utility scale contracted renewables. Although we view the commercial renewables business as higher risk than its regulated utility business segment, these assets for the most part sell power to investor owned, cooperative, or municipal utilities under risk mitigating long-term contracts.

ACP is a 600-mile interstate natural gas pipeline being built by Dominion from West Virginia to eastern North Carolina. Duke holds a 47% share in the project. The pipeline will supply natural gas from the Utica and Marcellus shale basins to natural gas generation at Duke Energy Carolinas and Duke Energy Progress, as well as to Piedmont and other utilities in the area.

Construction of ACP was recently halted due to adverse court rulings on environmental issues, including a biological opinion and a permit to cross under the Appalachian Trail. As a result, the estimated cost to complete the project recently increased by about $1 billion, and its estimated completion schedule has been extended by over a year. The pipeline is currently expected to cost between $7 and $7.8 billion ($3.3-$3.7 for Duke) and will likely be completed in two phases. Construction of the first phase, which does not cross the Appalachian Trail, is expected to be restarted in the fall following resolution of the biological opinion issue. A hearing on the biological opinion is scheduled to take place in May.

Construction of the second phase requires resolution of a Fourth Circuit Court of Appeals decision to vacate the permit issued by the U.S. Forest Service allowing ACP to cross under the Appalachian Trail. On February 25th, ACP's request for a rehearing on this matter was denied. ACP now plans to file an appeal with the Supreme Court, which if accepted, would likely not be determined until 2020, moving the estimated final completion date of the pipeline into 2021. The increased costs, and delay of cash flow from this project, are adding downward pressure to Duke's credit metrics.

Lag in the recovery of storm related costs will pressure metrics in the near term

In the fall and winter of 2018, Duke's operations were impacted by a succession of severe storms. Hurricane Florence arrived in mid-September and affected the company's operations in North and South Carolina. One month later, Hurricane Michael came ashore in the gulf region and caused damage all the way from Florida through North and South Carolina. In December 2018, Winter Storm Diego was the third major storm to impact Duke Energy Progress and Duke Energy Carolinas service territories.

Total costs for the three storms was in excess of $1 billion, primarily in Duke Energy Progress' North Carolina and Duke Energy Florida's service territories. Utilities in these territories have a good history of storm recovery, albeit with some regulatory lag. Duke currently plans to seek securitization legislation, which would assure recovery of costs at lower cost to customers; however recovery would likely not begin until 2020 and will be spread out over a number of years. In the meantime, Duke's consolidated debt balances are about $1 billion higher than previously forecast, which add negative pressure to credit metrics.

Recovery of coal ash expenditures has been mostly resolved, but lag persists

In 2014, North Carolina lawmakers overwhelmingly passed the Coal Ash Management Act of 2014, which regulates and requires the closure of coal ash basins at Duke's coal plant sites throughout the state. The legislation required Duke to take costly, immediate action to excavate and close ash basins at three of its highest risk sites (including two Duke Energy Progress plants) by August 2019 and a fourth by August 2022. The 2014 legislation also required the evaluation and classification of all of the remaining basins, many of which were initially determined to be of "intermediate" priority, which would have required closure by 2024.

In July 2016, new legislation was passed that amended the Coal Ash Management Act and required Duke to provide permanent alternative water supplies to neighbors within a half mile of its coal plants, but importantly also mandated the reclassification of certain intermediate priority sites as low priority once alternative water supplies are in place and certain dam enhancement projects are complete. This expanded the options for closing these basins and extends the time frame for closure to 2029.

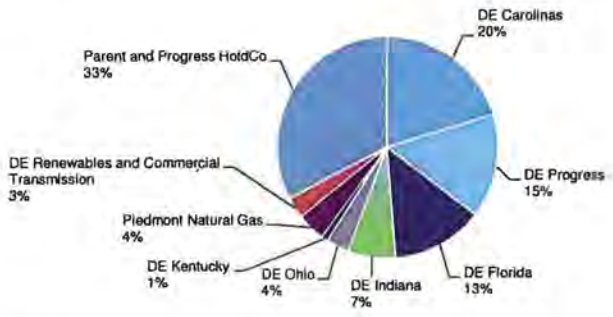
In 2014, Duke recognized a $3.5 billion Asset Retirement Obligation (ARO) for its estimated obligations to close its North Carolina coal ash basins. In the second quarter of 2015, after publication of the EPA's final Coal Combustion Rules, Duke incrementally increased the ARO by $1 billion as it created additional obligations for the company in South Carolina, Indiana, and Kentucky, putting its total ARO at $4.5 billion. Duke continues to refine its estimated obligations as work continues on the sites. As of December 31, 2018, Duke had spent approximately $1.8 billion on coal ash remediation, and its total remaining ARO was approximately $4.9 billion.

In Duke's largest jurisdictions in North and South Carolina, coal ash basin closure and remediation spending is not recovered via trackers or other automatic cost recovery provisions and must be recovered via base rate case filings. As result, there will likely continue to be regulatory lag in the recovery of these costs, which will put downward pressure on credit metrics.

Equity issuance has contained parent leverage – but it will still be relatively high

Duke's $2 billion 2018 equity issuance, and its plans for ongoing issuance of $500 million per year, have helped control the company's need for parent level debt financing. Prior to the announced 2018 equity issuance, we expected the level of parent debt to spike in 2018 and 2019 due in part to investments in ACP. Currently, we expect the proportion of Duke parent debt as a percentage of total consolidated debt will remain under 35%. This is still relatively high when compared to some other regulated utility holding company peers, and a factor in the wide differential between Duke and most of its subsidiaries' credit quality.

Exhibit 6
2018 Total Reported Debt by Entity



Source: Moody's Investors Service, Company

Carbon transition and environmental sustainability

Duke has moderate carbon transition risk within the regulated utility sector as the majority of its energy is generated by fossil fuels. In its 2017 Sustainability Report, Duke outlines key areas of opportunity that include modernizing the energy grid, generating cleaner energy using natural gas and renewables, and expanding the company's natural gas infrastructure to meet customer needs. Since 2005, Duke has reduced carbon dioxide emissions by 31% and currently plans a 40% reduction by 2030. As of 20187, the company's consolidated net output included about 31% from coal / oil fired resources, versus about 61% in 2005. By 2030 Duke estimates that 15% of its total company generation will be fired by coal.