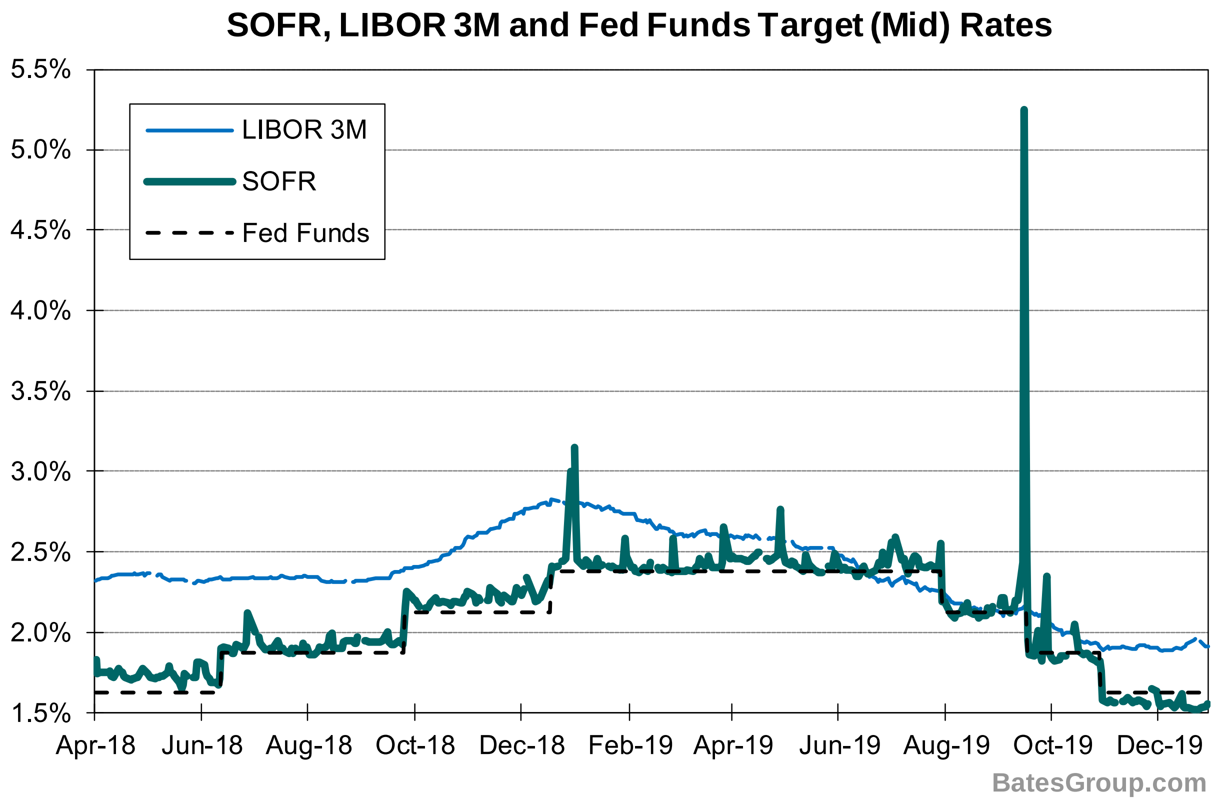
BATES RESEARCH

U.S. Chartbook

Economic and Capital Markets Analysis

2019 Year in Review

It's Almost Time to Say Goodbye (to LIBOR)



Greg Kyle

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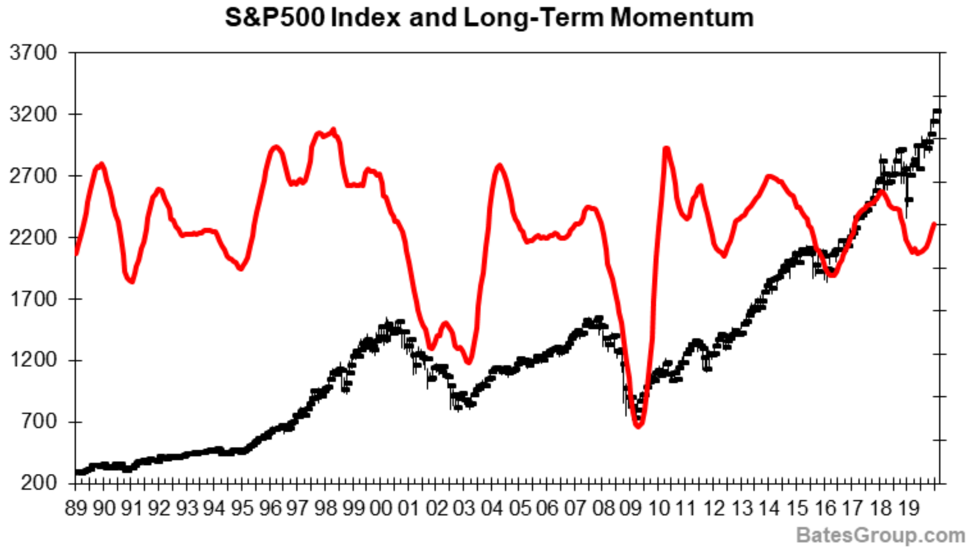
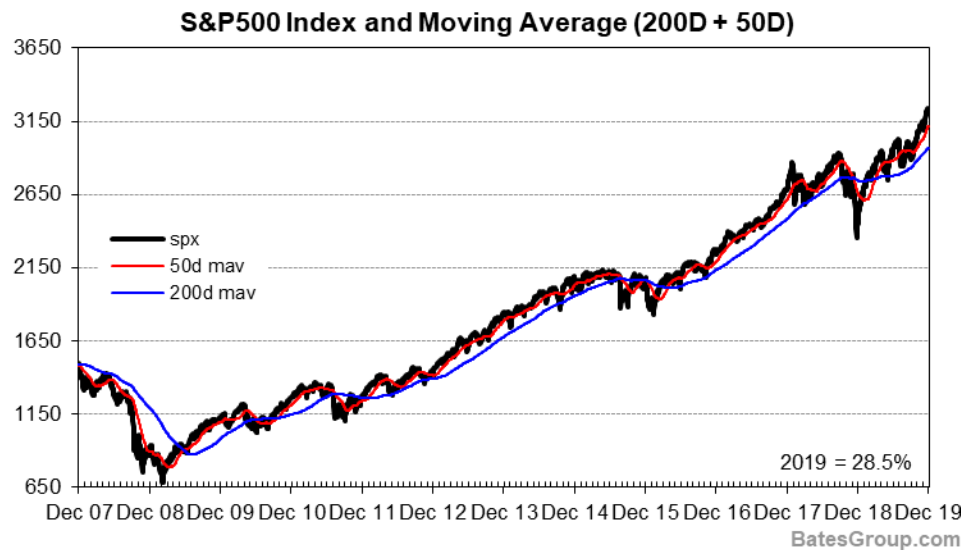
Equity Markets – S&P 500 Market Trends

2019 was a solid year for the broader equity market with the S&P 500 Index finishing the year up nearly 30%. Nearly half the yearly gains were in the first three months of 2019 as the markets rebounded from a 14% decline in the fourth quarter of 2018.

Marginal gains continued through the second and third quarters for the S&P 500, and the fourth quarter of 2019 posted a gain of 8.5%.

Over the past 20 years, the compound annual growth rate (CAGR) for the broader market has been 4.6%. The 50-year CAGR is 7.4%.





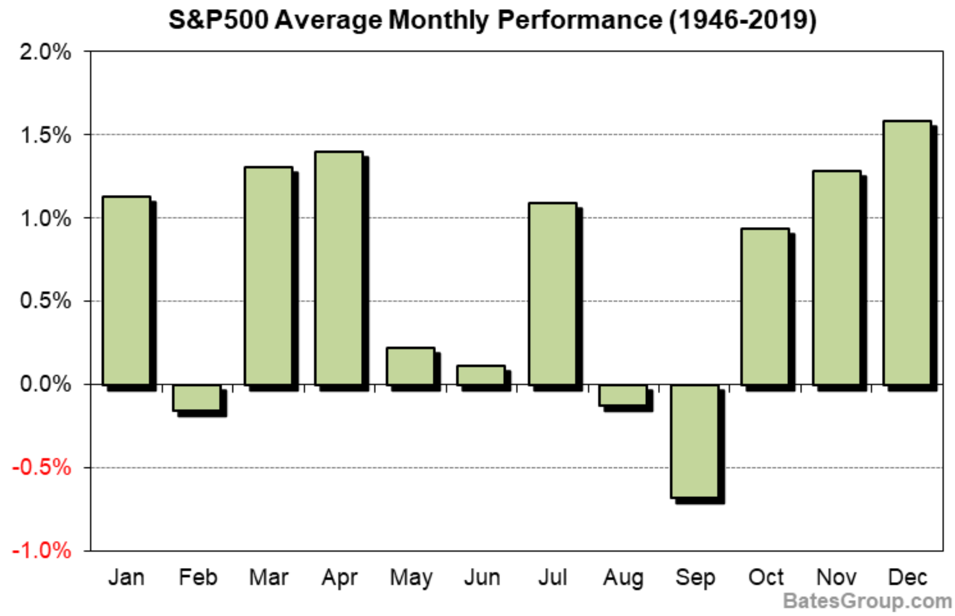
S&P 500 Monthly Performance (% change over previous month)

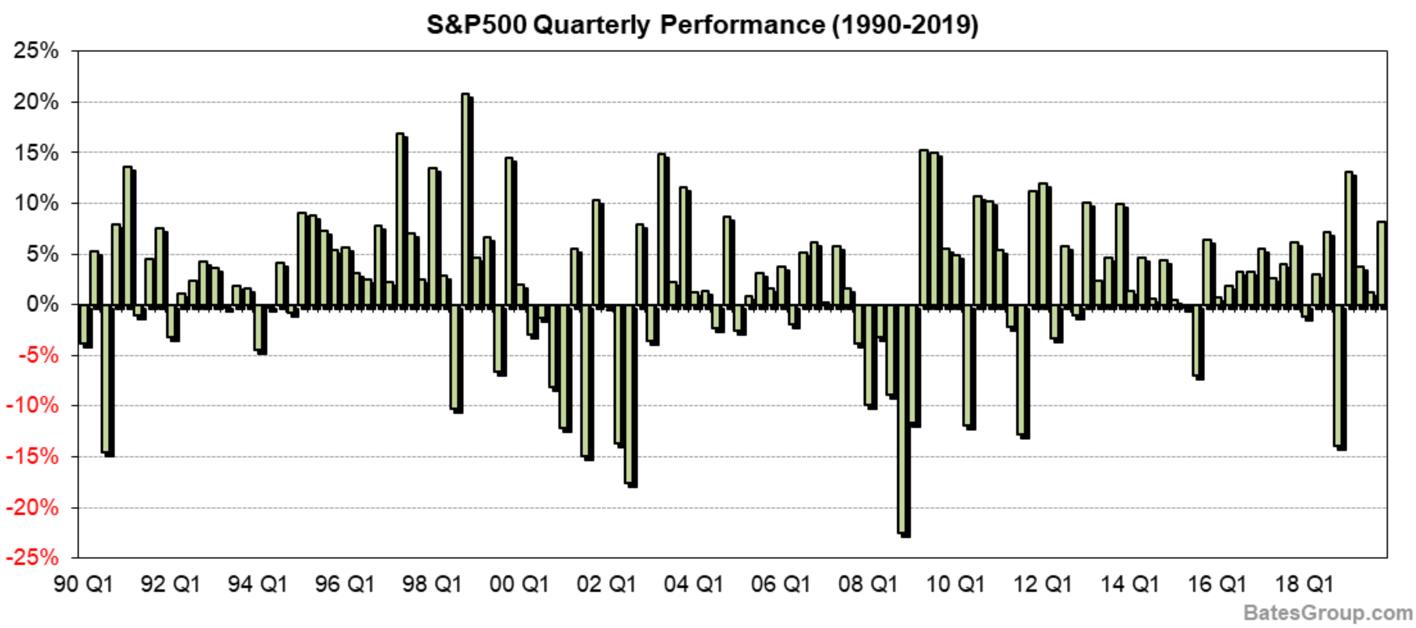
Month	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	46-19 Avg
Jan	1.7%	-2.5%	2.5%	1.4%	-6.1%	-8.6%	-3.7%	2.3%	4.4%	5.0%	-3.6%	-3.1%	-5.1%	1.8%	5.6%	7.9%	1.1%
Feb	1.2%	1.9%	0.0%	-2.2%	-3.5%	-11.0%	2.9%	3.2%	4.1%	1.1%	4.3%	5.5%	-0.4%	3.7%	-3.9%	3.0%	-0.2%
Mar	-1.6%	-1.9%	1.1%	1.0%	-0.6%	8.5%	5.9%	-0.1%	3.1%	3.6%	0.7%	-1.7%	6.6%	-0.0%	-2.7%	1.8%	1.3%
Apr	-1.7%	-2.0%	1.2%	4.3%	4.8%	9.4%	1.5%	2.8%	-0.7%	1.8%	0.6%	0.9%	0.3%	0.9%	0.3%	3.9%	1.4%
May	1.2%	3.0%	-3.1%	3.3%	1.1%	5.3%	-8.2%	-1.4%	-6.3%	2.1%	2.1%	1.0%	1.5%	1.2%	2.2%	-6.6%	0.2%
Jun	1.8%	-0.0%	0.0%	-1.8%	-8.6%	0.0%	-5.4%	-1.8%	4.0%	-1.5%	1.9%	-2.1%	0.1%	0.5%	0.5%	6.9%	0.1%
Jul	-3.4%	3.6%	0.5%	-2.0%	-1.0%	7.4%	6.9%	-2.1%	1.3%	4.9%	-1.5%	2.0%	3.6%	1.9%	3.6%	1.3%	1.1%
Aug	0.2%	-1.1%	2.1%	0.0%	1.2%	3.4%	-4.7%	-5.7%	2.0%	-3.1%	3.8%	-6.3%	-0.1%	0.1%	3.0%	-1.8%	-0.1%
Sep	0.9%	0.7%	2.5%	3.6%	-9.1%	3.6%	8.8%	-7.2%	2.4%	3.0%	-1.6%	-2.6%	-0.1%	1.9%	0.4%	1.7%	-0.7%
Oct	1.4%	-1.8%	3.2%	1.5%	-16.9%	-2.0%	3.7%	10.8%	-2.0%	4.5%	2.3%	8.3%	-1.9%	2.2%	-6.9%	2.0%	0.9%
Nov	3.9%	3.5%	1.6%	-4.4%	-7.5%	5.7%	-0.2%	-0.5%	0.3%	2.8%	2.5%	0.1%	3.4%	2.8%	1.8%	3.4%	1.3%
Dec	3.2%	-0.1%	1.3%	-0.9%	0.8%	1.8%	6.5%	0.9%	0.7%	2.4%	-0.4%	-1.8%	1.8%	1.0%	-9.2%	2.9%	1.6%

On a month-to-month basis, December has historically been the strongest performing month, while September has been the weakest.

The summer months have also been historically weak, which led to the old Wall Street adage, "Sell in May, go away."

In terms of quarterly returns, the fourth quarter has been the strongest quarter on average, followed by the first quarter with average (1946-2019) gains of 3.3% and 2.3% respectively.





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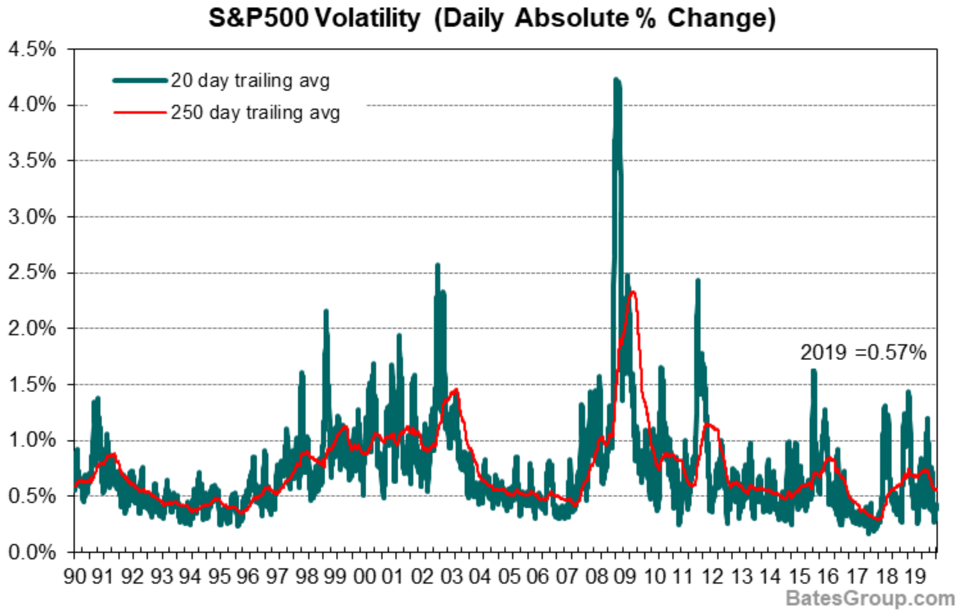
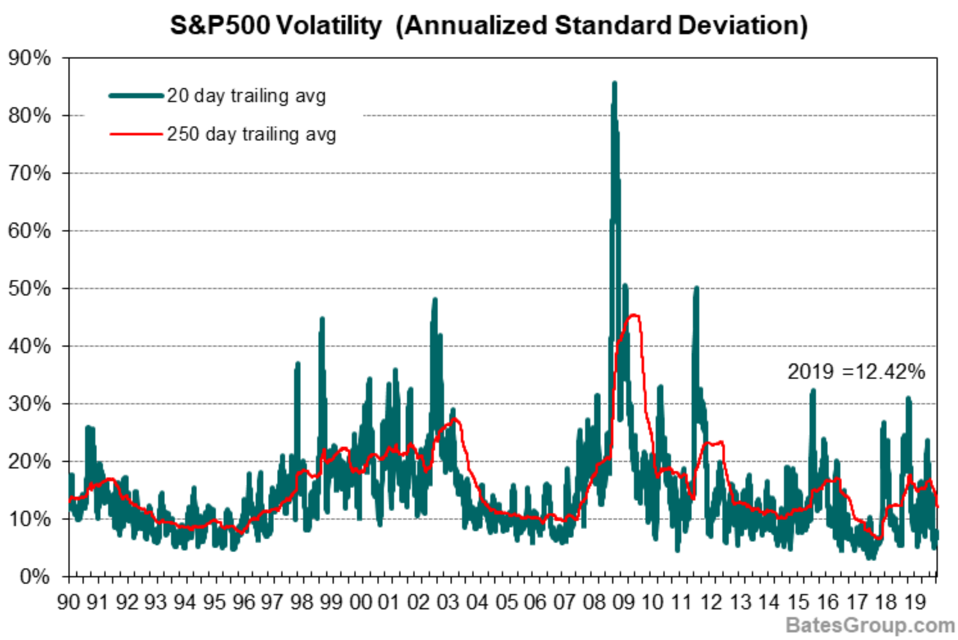
Volatility for the broader market decreased moderately in 2019, with the S&P 500 moving up or down 0.57% each day on average, compared to ±0.74% in 2018.

Volatility was muted in the last quarter of the year, with average absolute daily price swings of only 0.46%.

In comparison, over the past 20 years, the average daily absolute price swing has been 0.62%.



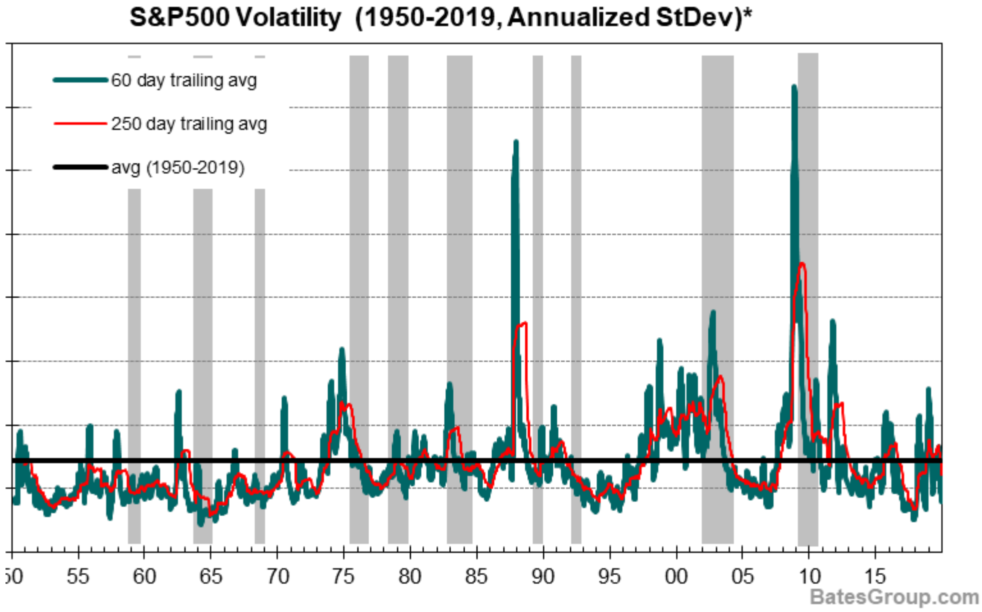
In terms of annualized standard deviation, 2019's 12.42% is below the 13.6% average since 1950. Volatility in the last quarter of the year was 9.37%.



The chart to the right shows volatility for the broader market over the past 60-plus years.

Not surprisingly, the unprecedented credit crisis in 2008 had a significant impact on the equity markets, with the markets experiencing some of the highest volatility in history, even surpassing the crash of October 1987.

In 2019, the S&P 500 experienced only 37 days of 1% or greater daily price moves. This compares to 64 days in 2018.



A History of Bear Markets (1929-2019)

Market Peak	Index Top	% ch [1]	Recovery from prior Btm	Market Bottom	Index Bottom	% ch [2]	Duration of Bear Mkt
9/16/1929	31.86	--	--	6/1/1932	4.40	-86.2%	33 months
3/10/1937	18.67	324.3%	58 months	3/31/1938	8.50	-54.5%	13 months
11/9/1938	13.79	62.2%	7 months	4/28/1942	7.47	-45.8%	42 months
5/29/1946	19.25	157.7%	50 months	6/13/1949	13.55	-29.6%	37 months
8/2/1956	49.74	267.1%	87 months	10/22/1957	38.98	-21.6%	15 months
12/12/1961	72.64	436.1%	50 months	6/26/1962	52.32	-28.0%	7 months
2/9/1966	94.06	79.8%	44 months	10/7/1966	73.20	-22.2%	8 months
11/29/1968	108.37	48.0%	26 months	5/26/1970	69.29	-36.1%	18 months
1/11/1973	120.24	73.5%	32 months	10/3/1974	62.28	-48.2%	21 months
9/21/1976	107.83	73.1%	24 months	3/6/1978	86.90	-19.4%	18 months
11/28/1980	140.52	61.7%	33 months	8/12/1982	102.42	-27.1%	21 months
8/25/1987	336.77	228.8%	61 months	12/4/1987	223.92	-33.5%	3 months
7/16/1990	368.95	64.8%	32 months	10/11/1990	295.46	-19.9%	3 months
3/24/2000	1527.46	582.1%	150 months	10/9/2002	776.76	-49.1%	31 months
10/9/2007	1565.15	101.5%	60 months	3/9/2009	676.53	-56.8%	17 months

1) Percentage change from prior market bottom index value
2) Percentage change from prior peak index value

** Shaded areas represent bear markets*

S&P 500 Historical Volatility Table*

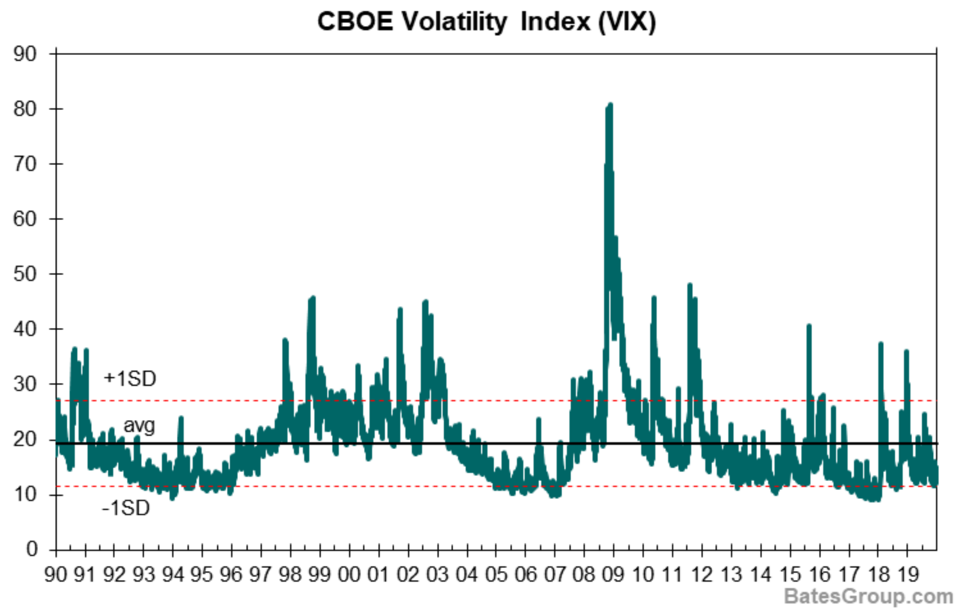
Number of Days with Percentage Moves Greater Than …

	<-1.0%	>1.0%	Total	<-2.0%	>2.0%	Total	<-4.0%	>4.0%	Total	<-5.0%	>5.0%	Total	daily avg abs % ch	annualized stdev
1970	34	31	65	4	7	11	0	1	1	0	1	1	0.69%	15.10%
1971	14	18	32	0	1	1	0	0	0	0	0	0	0.48%	10.17%
1972	6	4	10	0	0	0	0	0	0	0	0	0	0.40%	7.93%
1973	43	35	78	6	9	15	0	0	0	0	0	0	0.78%	15.76%
1974	67	47	114	15	17	32	0	3	3	0	0	0	1.06%	21.73%
1975	35	45	80	3	8	11	0	0	0	0	0	0	0.79%	15.37%
1976	14	25	39	0	0	0	0	0	0	0	0	0	0.57%	11.06%
1977	12	5	17	0	0	0	0	0	0	0	0	0	0.45%	9.04%
1978	24	19	43	1	3	4	0	0	0	0	0	0	0.61%	12.55%
1979	13	17	30	1	2	3	0	0	0	0	0	0	0.51%	10.80%
1980	37	43	80	7	4	11	0	0	0	0	0	0	0.82%	16.40%
1981	30	24	54	4	3	7	0	0	0	0	0	0	0.66%	13.40%
1982	38	44	82	6	11	17	0	1	1	0	0	0	0.85%	18.18%
1983	26	29	55	1	3	4	0	0	0	0	0	0	0.66%	13.27%
1984	16	25	41	0	7	7	0	0	0	0	0	0	0.61%	12.70%
1985	7	21	28	0	1	1	0	0	0	0	0	0	0.50%	10.12%
1986	25	35	60	6	3	9	1	0	1	0	0	0	0.67%	14.64%
1987	42	53	95	20	20	40	4	3	7	3	2	5	1.13%	32.01%
1988	31	37	68	5	11	16	2	0	2	1	0	1	0.74%	17.02%
1989	14	26	40	2	2	4	1	0	1	1	0	1	0.58%	13.01%
1990	42	33	75	8	5	13	0	0	0	0	0	0	0.77%	15.89%
1991	25	34	59	2	7	9	0	0	0	0	0	0	0.67%	14.24%
1992	11	17	28	0	0	0	0	0	0	0	0	0	0.46%	9.64%
1993	7	10	17	1	0	1	0	0	0	0	0	0	0.40%	8.57%
1994	15	12	27	1	1	2	0	0	0	0	0	0	0.46%	9.80%
1995	4	9	13	0	0	0	0	0	0	0	0	0	0.37%	7.78%
1996	17	21	38	3	0	3	0	0	0	0	0	0	0.56%	11.73%
1997	31	50	81	6	9	15	1	1	2	1	1	2	0.85%	18.06%
1998	32	47	79	12	11	23	1	2	3	1	1	2	0.92%	20.21%
1999	40	52	92	9	14	23	0	0	0	0	0	0	0.91%	18.00%
2000	54	48	102	19	18	37	1	1	2	1	0	1	1.06%	22.13%
2001	54	51	105	13	12	25	2	2	4	0	1	1	1.03%	21.47%
2002	72	53	125	29	23	52	1	5	6	0	2	2	1.27%	25.94%
2003	37	45	82	5	10	15	0	0	0	0	0	0	0.83%	17.00%
2004	20	21	41	0	0	0	0	0	0	0	0	0	0.54%	11.05%
2005	17	13	30	0	0	0	0	0	0	0	0	0	0.52%	10.24%
2006	13	16	29	0	2	2	0	0	0	0	0	0	0.47%	10.00%
2007	34	31	65	11	6	17	0	0	0	0	0	0	0.72%	15.92%
2008	75	59	134	41	31	72	15	13	28	11	7	18	1.74%	40.79%
2009	55	62	117	28	27	55	6	5	11	1	2	3	1.24%	27.18%
2010	37	39	76	10	12	22	0	1	1	0	0	0	0.80%	17.98%
2011	48	48	96	21	14	35	4	3	7	1	0	1	1.04%	23.18%
2012	21	29	50	3	3	6	0	0	0	0	0	0	0.59%	12.72%
2013	17	21	38	2	2	4	0	0	0	0	0	0	0.54%	11.02%
2014	19	19	38	4	2	6	0	0	0	0	0	0	0.53%	11.33%
2015	31	41	72	6	4	10	0	0	0	0	0	0	0.72%	15.43%
2016	22	26	48	5	4	9	0	0	0	0	0	0	0.58%	13.04%
2017	4	4	8	0	0	0	0	0	0	0	0	0	0.30%	6.66%
2018	32	32	64	15	5	20	1	1	2	0	0	0	0.74%	16.98%
2019	15	22	37	5	2	7	0	0	0	0	0	0	0.57%	12.42%
av50-19	**25**	`	**51**	**5**	**5**	**11**	**1**	**1**	**1**	**0**	**0**	**1**	**0.66%**	**15.18%**

* Based on daily closing prices

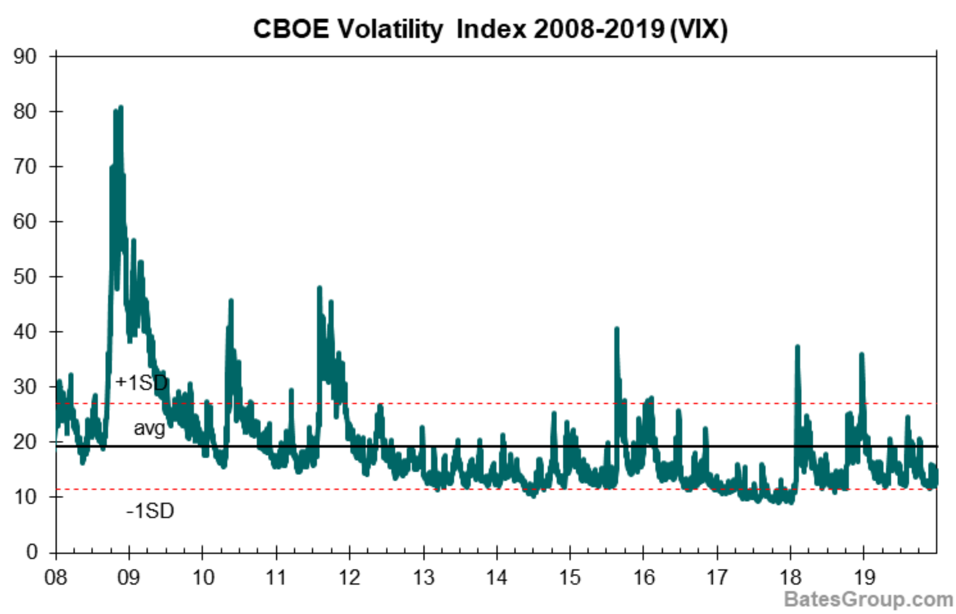
The CBOE Volatility Index experienced lower volatility in the latter half of 2019 compared to earlier in the year, with an average daily close of 13.76 in December. This compares to the average close of 19.15 for the 1990-2019 period.

The VIX Index, a measure of the market's expectation of future short-term volatility, is composed of S&P 500 call and put options over a wide range of strike prices, with expirations between 23 and 37 days.



The VIX Index did not experience any significant daily index moves in 2019.

In comparison, early 2018 was notable for the VIX Index in that it experienced its largest daily move since the inception of the index. On February 5th, the volatility index rose an unprecedented 20.01 points, or 115% from the previous day. The previous highest daily move was during the peak of the credit crisis in October 2018, when the VIX Index rose 16.54 points or 64.2%.



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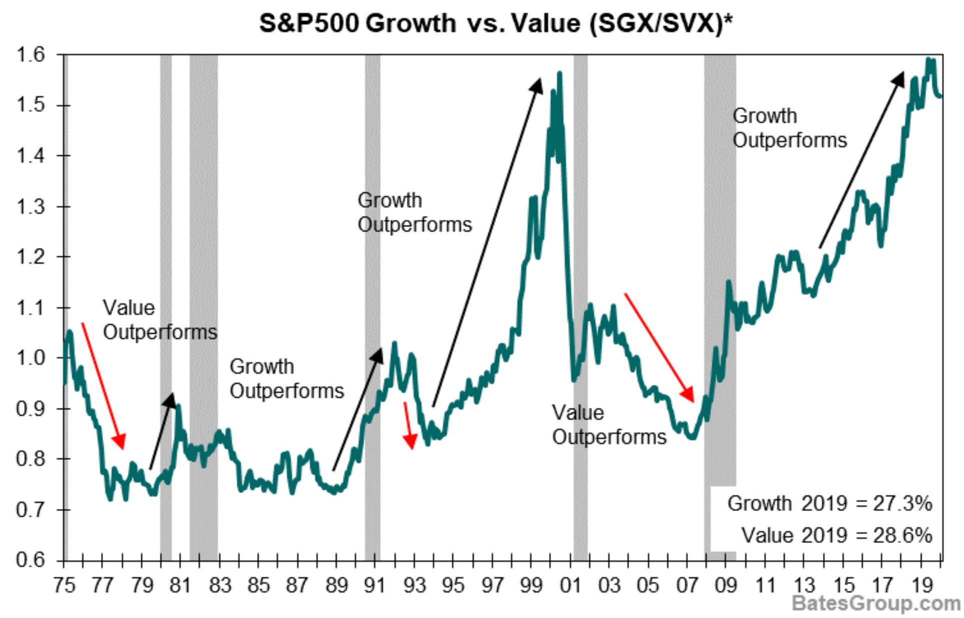
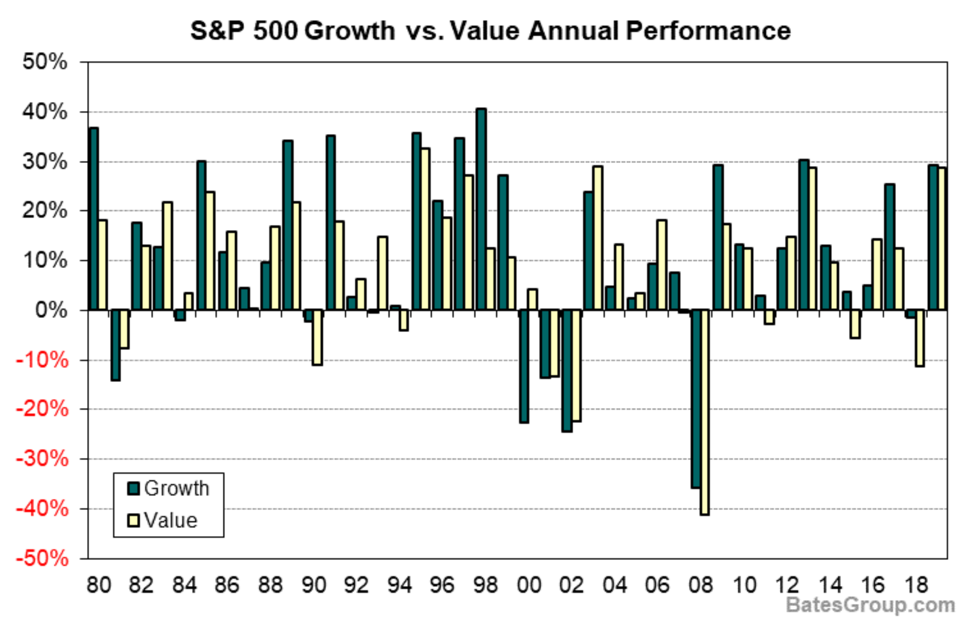
Growth vs. Value

In the trade-off between growth and value, both investment styles were largely even in 2019. The S&P Value Index was up 28.6% for the year, while the S&P Growth Index climbed 27.3%.



The chart to the right gives a more detailed performance comparison between growth and value styles over the past 40 years.

Prior to 2018, The last time both style indices posted negative declines was during the bear market in 2008. The bear market of 2001-02 was also marked by a decline in both style indices.

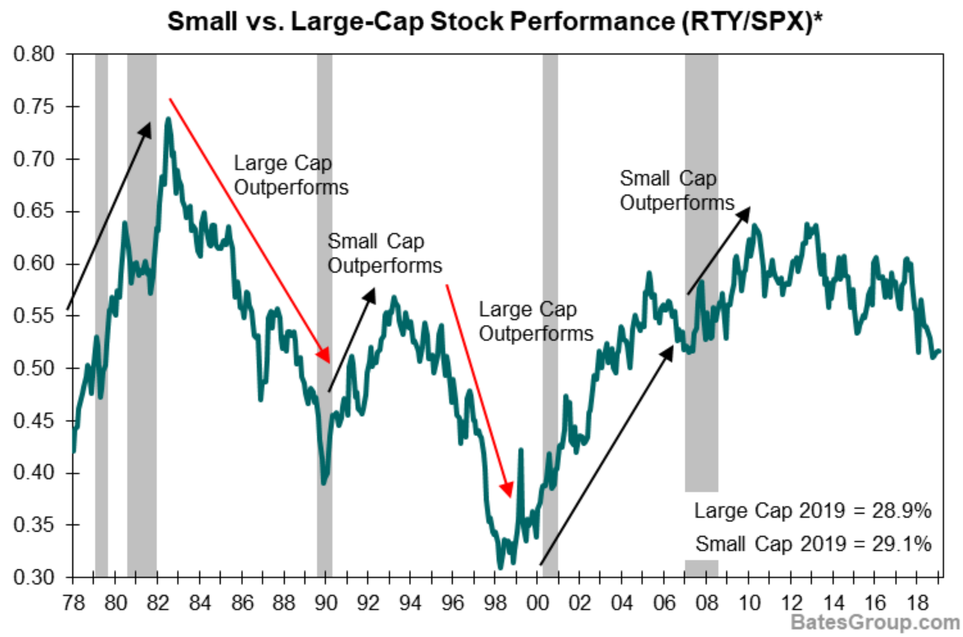


** Shaded areas represent recessions*

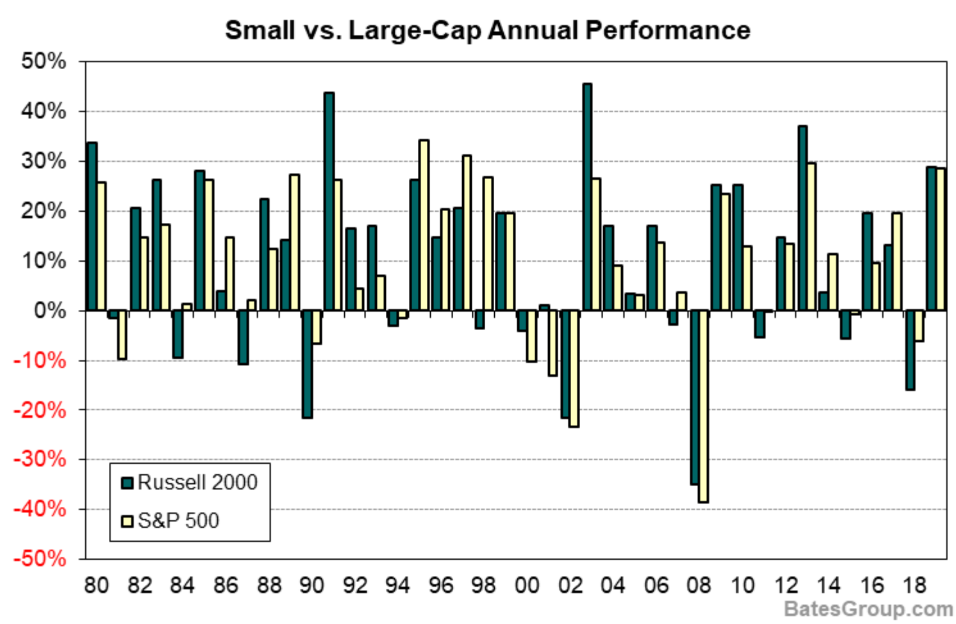
Large vs. Small

Small capitalization stocks, as represented by the Russell 200 Index gained 29.1% during the year. Large capitalization stocks, as represented by the S&P 500, kept pace, climbing 28.9% in 2019.

Most of the losses for both indices occurred in the last quarter of the year, with the S&P 500 down 14% and the Russell 2000 falling nearly 24%.



During recessions, neither investment styles provide shelter. This can be seen in the chart to the right in which both indices declined during the 1990, 2000 and 2008 recessions.



** Shaded areas represent recessions*

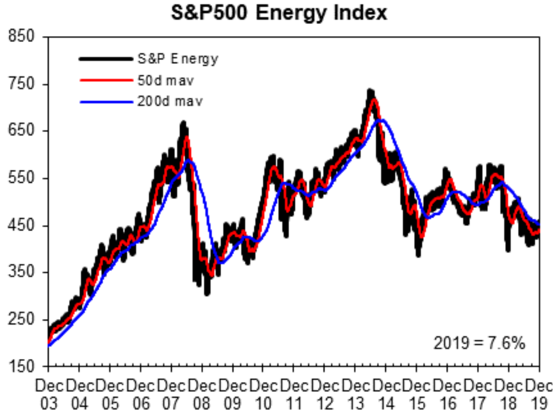
S&P 500 Sector Trends

Signaling the breadth of the solid market performance in 2019, all S&P 500 sectors posted double-digit gains.

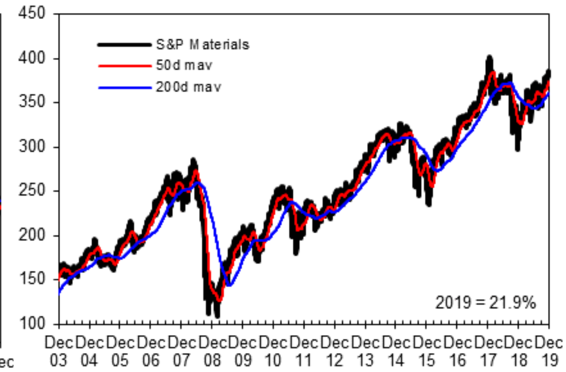
The information technology sector was the strongest performer in 2019 with a gain of 48.0%, followed by communications services with a gain of 30.9%

Energy was the weakest sector of the year with a gain of only 7.6%.

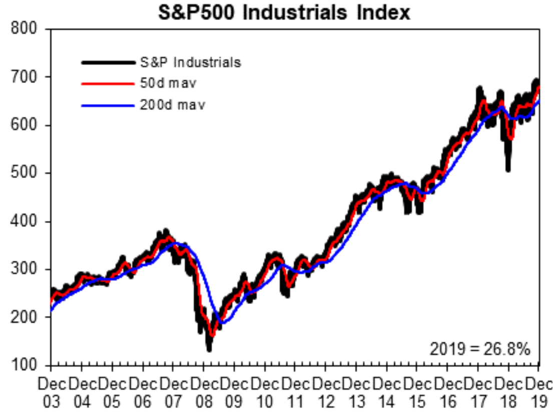
S&P500 Energy Index



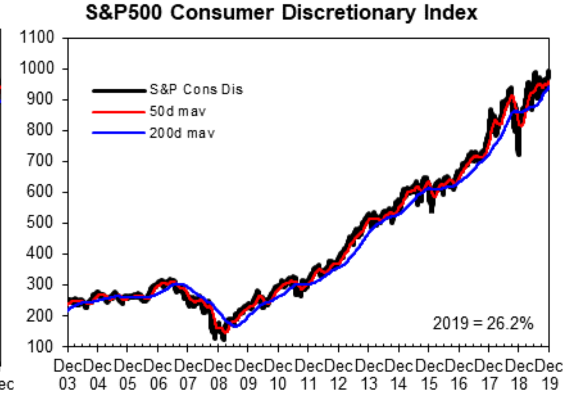
S&P500 Materials Index



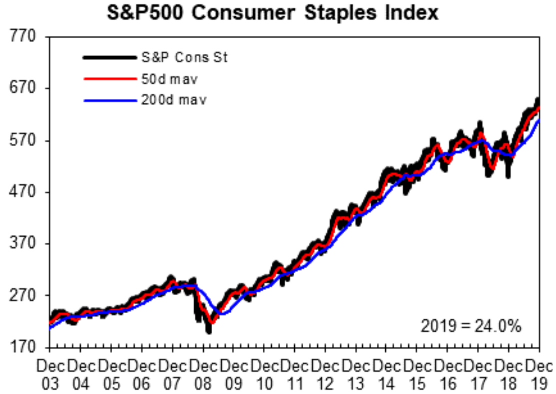
S&P500 Industrials Index



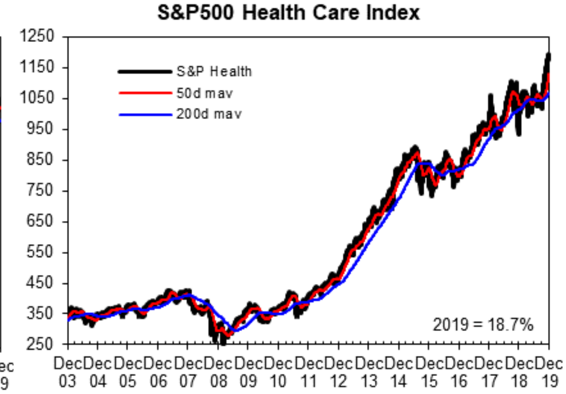
S&P500 Consumer Discretionary Index



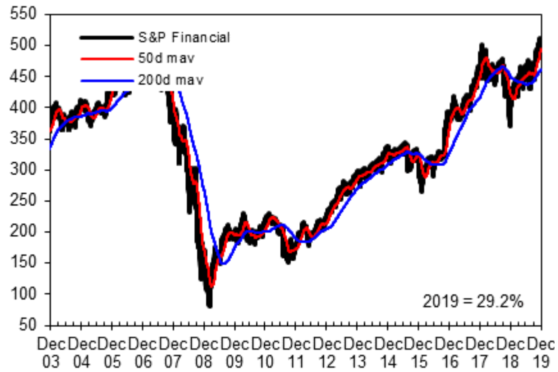
S&P500 Consumer Staples Index



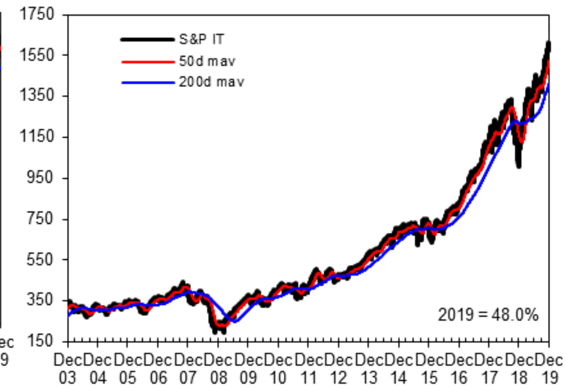
S&P500 Health Care Index



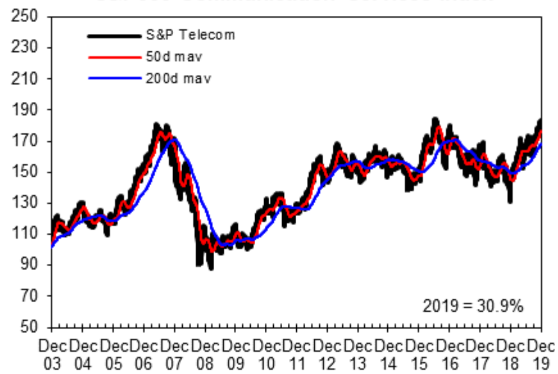
S&P500 Financials Index



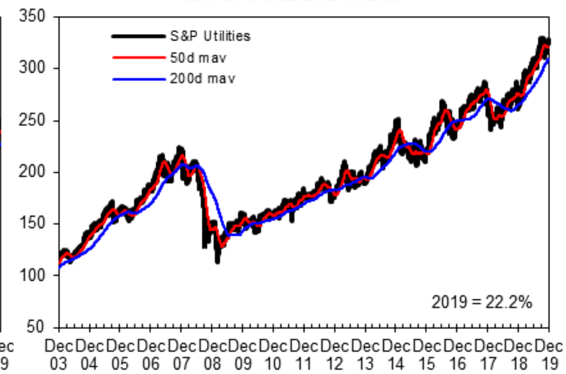
S&P500 Information Technology



S&P500 Communication Services Index



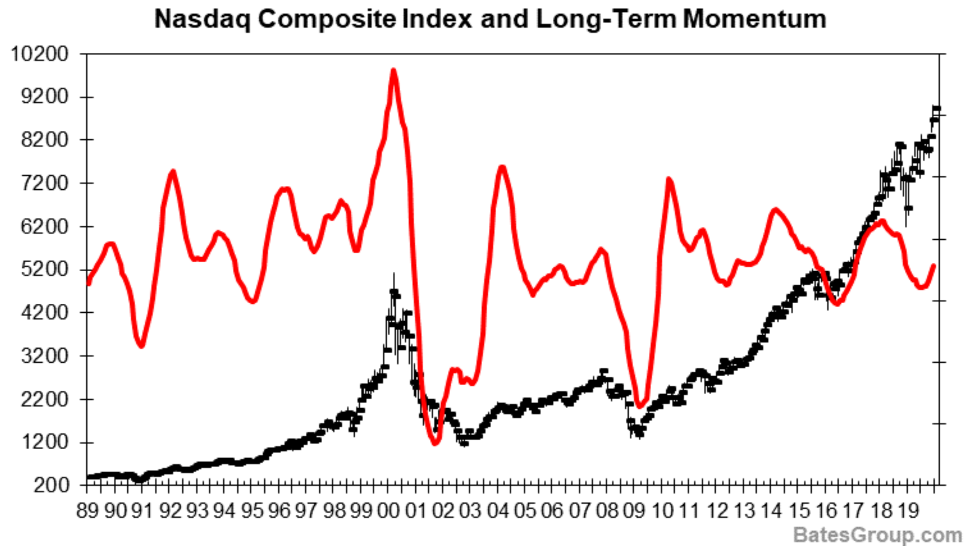
S&P500 Utilities Index



Nasdaq Market Trends

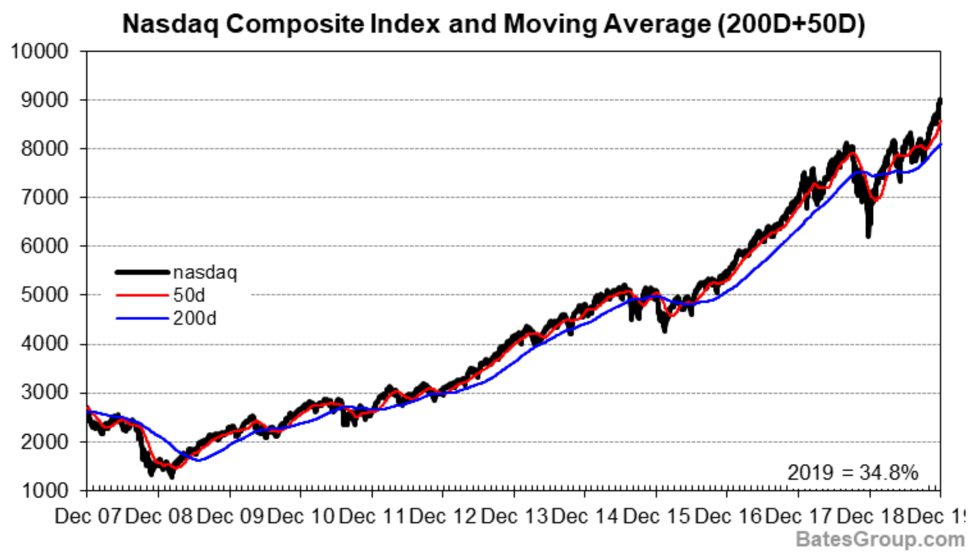
The tech-focused Nasdaq Composite Index finished 2019 up 35.2% as it rebounded from a weak performance in the last quarter of 2018.

In Q4 of last year, the tech index rose 12.2%.



In 2019 the Composite Index posted gains in 10 of the 12 months of the year.

The strongest gains were in the first four months of the year with the last quarter of 2019 also showing solid gains (see table below).

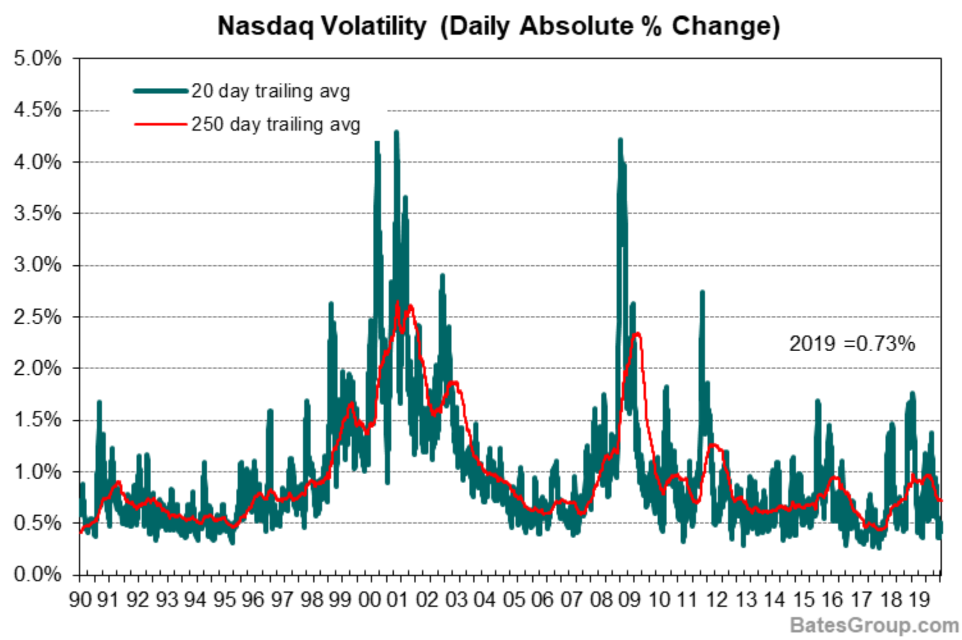


Nasdaq Monthly Performance (% change over previous month)

Month	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	85-19 Avg
Jan	3.1%	-5.2%	4.6%	2.0%	-9.9%	-6.4%	-5.4%	1.8%	8.0%	4.1%	-1.7%	-2.1%	-7.9%	4.3%	7.4%	9.7%	2.6%
Feb	-1.8%	-0.5%	-1.1%	-1.9%	-5.0%	-6.7%	4.2%	3.0%	5.4%	0.6%	5.0%	7.1%	-1.2%	3.8%	-1.9%	3.4%	1.1%
Mar	-1.8%	-2.6%	2.6%	0.2%	0.3%	10.9%	7.1%	-0.0%	4.2%	3.4%	-2.5%	-1.3%	6.8%	1.5%	-2.9%	2.6%	1.0%
Apr	-3.7%	-3.9%	-0.7%	4.3%	5.9%	12.3%	2.6%	3.3%	-1.5%	1.9%	-2.0%	0.8%	-1.9%	2.3%	0.0%	4.7%	1.1%
May	3.5%	7.6%	-6.2%	3.1%	4.6%	3.3%	-8.3%	-1.3%	-7.2%	3.8%	3.1%	2.6%	3.6%	2.5%	5.3%	-7.9%	1.3%
Jun	3.1%	-0.5%	-0.3%	-0.0%	-9.1%	3.4%	-6.5%	-2.2%	3.8%	-1.5%	3.9%	-1.6%	-2.1%	-0.9%	0.9%	7.4%	0.8%
Jul	-7.8%	6.2%	-3.7%	-2.2%	1.4%	7.8%	6.9%	-0.6%	0.2%	6.6%	-0.9%	2.8%	6.6%	3.4%	2.2%	2.1%	0.8%
Aug	-2.6%	-1.5%	4.4%	2.0%	1.8%	1.5%	-6.2%	-6.4%	4.3%	-1.0%	4.8%	-6.9%	1.0%	1.3%	5.7%	-2.6%	0.1%
Sep	3.2%	-0.0%	3.4%	4.0%	-11.6%	5.6%	12.0%	-6.4%	1.6%	5.1%	-1.9%	-3.3%	1.9%	1.0%	-0.8%	0.5%	-0.4%
Oct	4.1%	-1.5%	4.8%	5.8%	-17.7%	-3.6%	5.9%	11.1%	-4.5%	3.9%	3.1%	9.4%	-2.3%	3.6%	-9.2%	3.7%	0.9%
Nov	6.2%	5.3%	2.7%	-6.9%	-10.8%	4.9%	-0.4%	-2.4%	1.1%	3.6%	3.5%	1.1%	2.6%	2.2%	0.3%	4.5%	1.6%
Dec	3.7%	-1.2%	-0.7%	-0.3%	2.7%	5.8%	6.2%	-0.6%	0.3%	2.9%	-1.2%	-2.0%	1.1%	0.4%	-9.5%	3.5%	1.9%

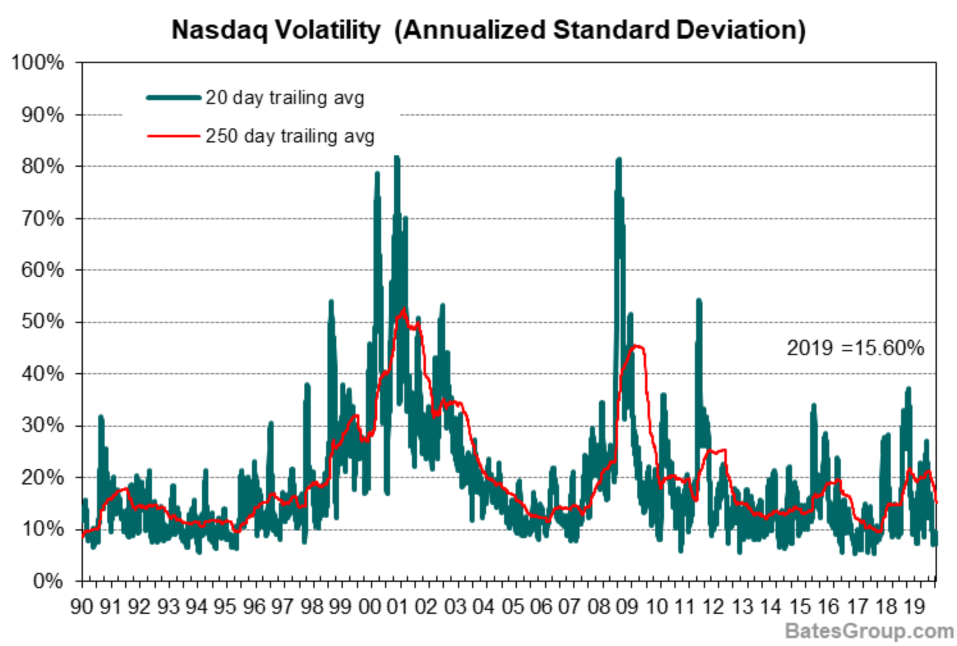
Volatility decreased in 2019 with the Nasdaq Composite Index moving up or down 0.73% each day on average. In comparison, the absolute average daily price change in 2018 was 0.93%.

In Q4, the tech-heavy index moved up or down 0.56% each day on average. This compares to a long term absolute average daily price swing of +/- 0.90%.



Volatility as measured by the traditional metric of standard deviation was 10.79% in the fourth quarter. This was up from the 15.60% annualized standard deviation for the entire year.

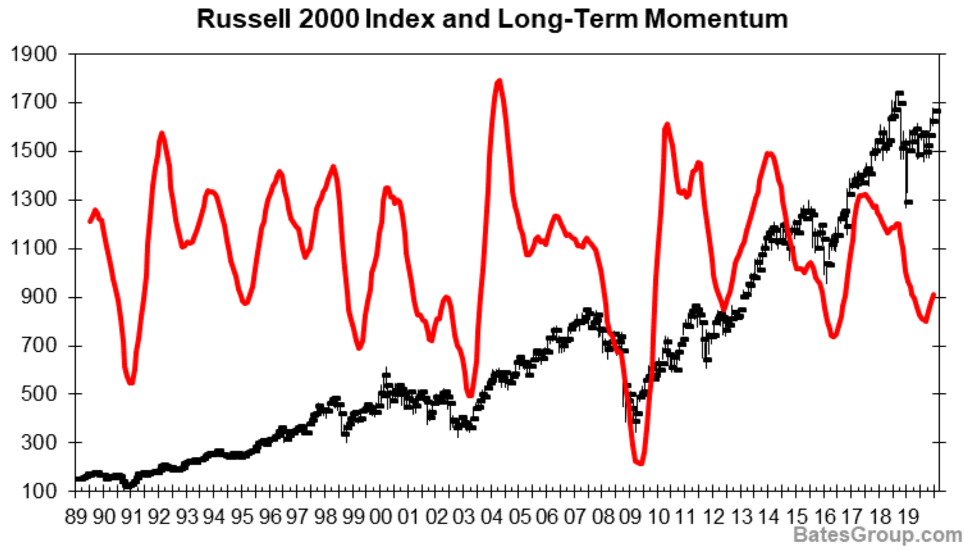
The long-term average annual volatility (1985-2019) for the Nasdaq Composite Index has been 21.54%.

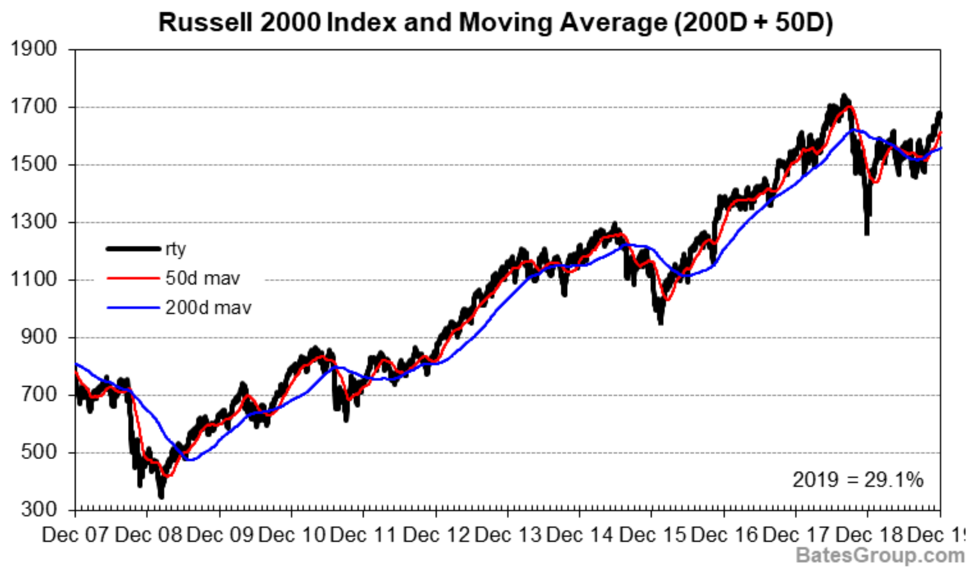


Russell 2000 Market Trends

Small cap stocks as measured by the Russell 2000 Index closed the year up 29.1%.

In the last quarter of 2019, the small cap index gained 9.5%.





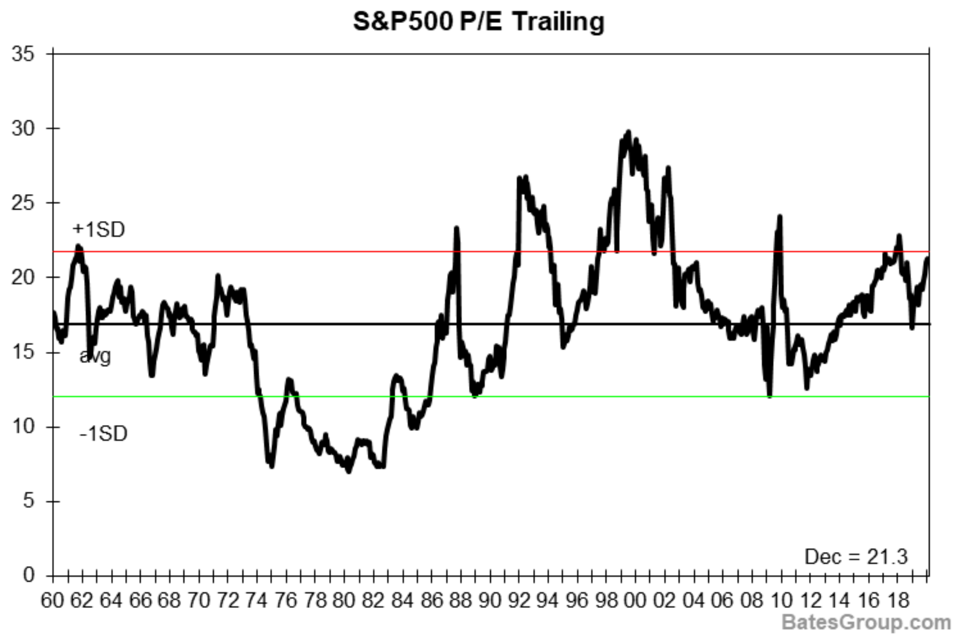
Russell 2000 Monthly Performance (% change over previous month)

Month	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	86-19 Avg
Jan	4.3%	-4.2%	8.9%	1.6%	-6.9%	-11.2%	-3.7%	-0.3%	7.0%	6.2%	-2.8%	-3.3%	-8.8%	0.3%	2.6%	16.0%	1.2%
Feb	0.8%	1.6%	-0.3%	-0.9%	-3.8%	-12.3%	4.4%	5.4%	2.3%	1.0%	4.6%	5.8%	-0.1%	1.8%	-4.0%	5.1%	1.7%
Mar	0.8%	-3.0%	4.7%	0.9%	0.3%	8.7%	8.0%	2.4%	2.4%	4.4%	-0.8%	1.6%	7.8%	-0.1%	1.1%	-2.3%	1.7%
Apr	-5.2%	-5.8%	-0.1%	1.7%	4.1%	15.3%	5.6%	2.6%	-1.6%	-0.4%	-3.9%	-2.6%	1.5%	1.0%	0.8%	3.3%	1.2%
May	1.5%	6.4%	-5.7%	4.0%	4.5%	2.9%	-7.7%	-2.0%	-6.7%	3.9%	0.7%	2.2%	2.1%	-2.2%	5.9%	-6.6%	1.1%
Jun	4.1%	3.7%	0.5%	-1.6%	-7.8%	1.3%	-7.9%	-2.5%	4.8%	-0.7%	5.2%	0.6%	-0.2%	3.3%	0.6%	5.5%	0.6%
Jul	-6.8%	6.3%	-3.3%	-6.9%	3.6%	9.5%	6.8%	-3.7%	-1.4%	6.9%	-6.1%	-1.2%	5.9%	0.7%	1.7%	0.5%	-0.4%
Aug	-0.6%	-1.9%	2.9%	2.2%	3.5%	2.8%	-7.5%	-8.8%	3.2%	-3.3%	4.8%	-6.4%	1.6%	-1.4%	4.2%	-5.1%	-0.4%
Sep	4.6%	0.2%	0.7%	1.6%	-8.1%	5.6%	12.3%	-11.4%	3.1%	6.2%	-6.2%	-5.1%	0.9%	6.1%	-2.5%	1.9%	-0.2%
Oct	1.9%	-3.2%	5.7%	2.8%	-20.9%	-6.9%	4.0%	15.0%	-2.2%	2.5%	6.5%	5.6%	-4.8%	0.8%	-10.9%	2.6%	-0.8%
Nov	8.6%	4.7%	2.5%	-7.3%	-12.0%	3.0%	3.4%	-0.5%	0.4%	3.9%	-0.0%	3.1%	11.0%	2.8%	1.4%	4.0%	1.5%
Dec	2.8%	-0.6%	0.2%	-0.2%	5.6%	7.9%	7.8%	0.5%	3.3%	1.8%	2.7%	-5.2%	2.6%	-0.6%	-15.7%	2.7%	2.3%

Equity Valuation

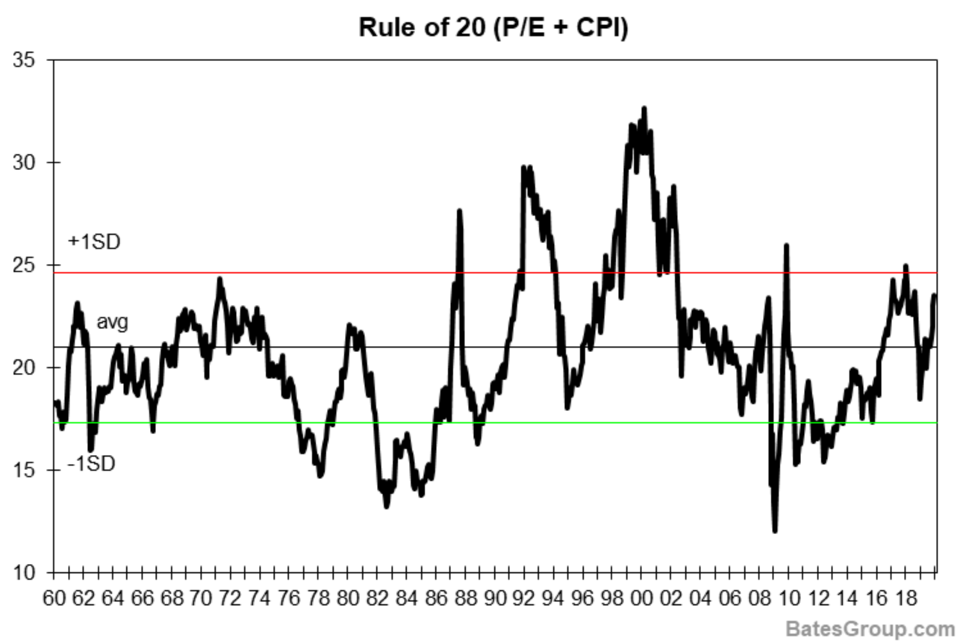
In 2019, earnings growth slowed down with estimated* operating profits for the S&P 500 increasing just 3% over the prior year. This is based on Standard & Poor's estimate with 97.8% of companies reporting.

In terms of valuation, the S&P 500 Index closed 2019 trading at 21.3 times trailing earnings. This P/E ratio is at the higher range of valuation based on the historical trend from 1960-2019.



The Rule of 20 is a popular measure to assess P/E ratios for the broader market, adjusting for inflation.

Taking inflation into account, but ignoring the impact of interest rates, the S&P 500 appears to be overvalued based on the average since 1960.

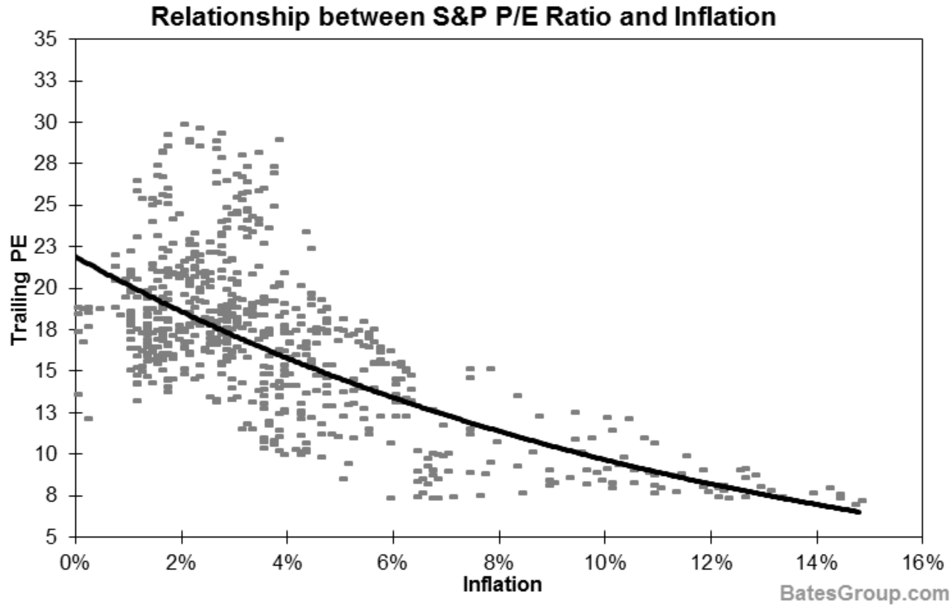


** Standard and Poor's estimate*

Lower inflation rates tend to lead to higher equity market valuations and vice versa.

The chart on the right shows the relationship between P/E ratios (S&P 500) and inflation over the past 60 years.

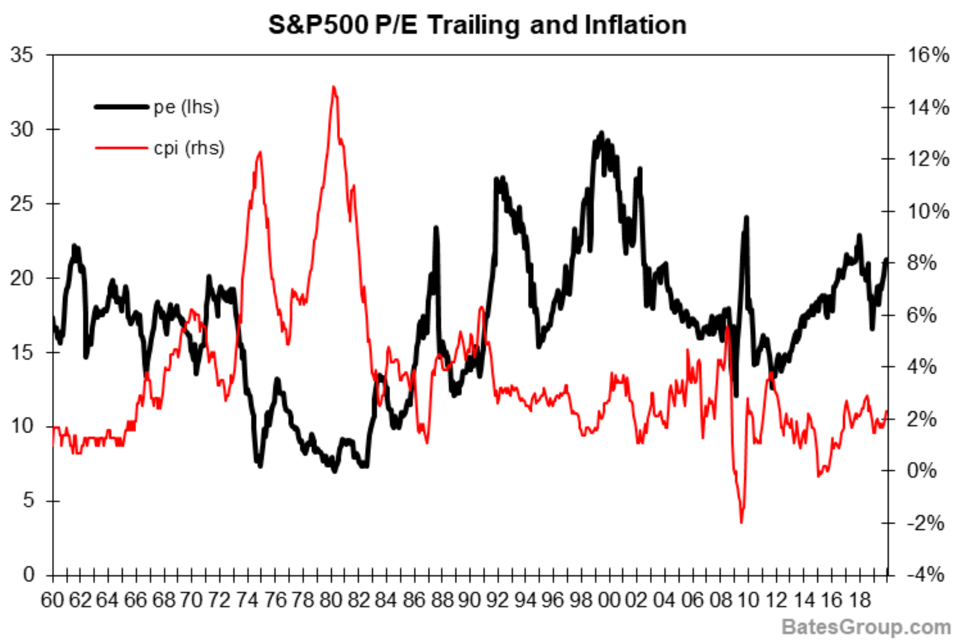
In similar periods when inflation has been below 3.5%, the S&P 500 has traded in a range of 11 to 30 times trailing earnings.



Here is another view showing the relationship between P/E ratios and inflation.

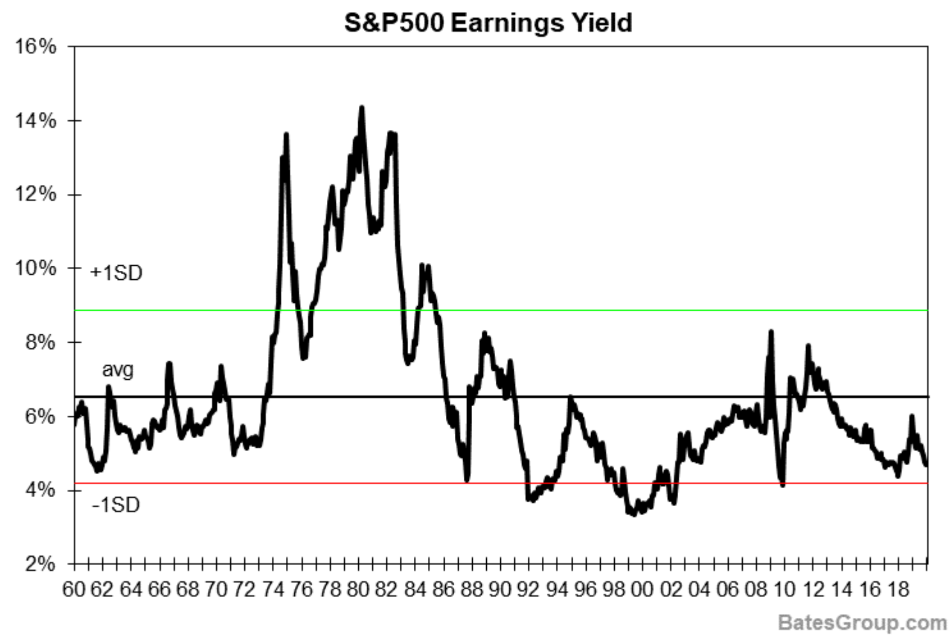
P/Es have tended to be higher in low inflation periods and vice versa.

Trailing P/E if inflation is:	<3.5%	3.5-5%	>5%
Low	11.0	9.8	7.0
Avg.	**19.2**	**15.8**	**11.3**
High	30.2	29.3	18.2
-1SD	15.2	12.0	8.0
+1SD	23.3	19.7	14.6



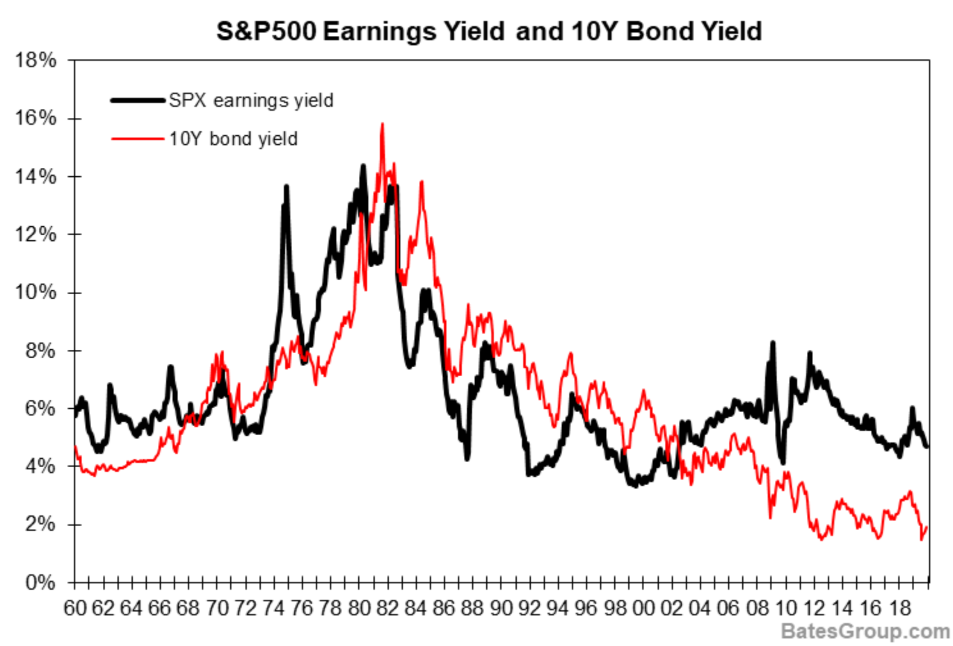
The earnings yield (inverse of the P/E ratio) has remained below the long-term average in 2018, suggesting a modestly overvalued market.

It's worth bearing in mind that the high earnings yield (and low P/Es) of the 1970's and early 1980's was a function of high inflation and interest rates.



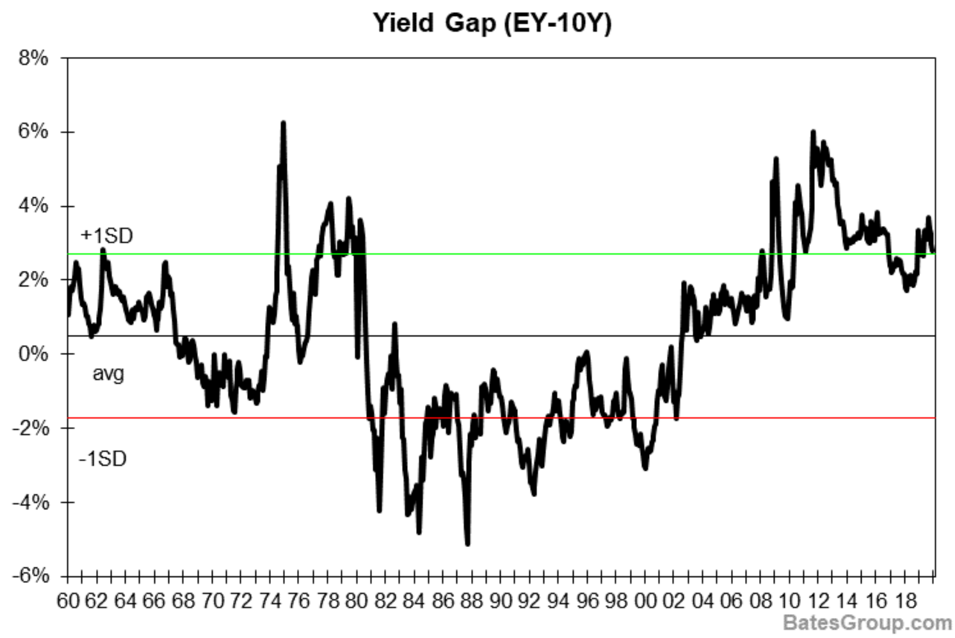
Historically, there has been a high correlation between the level of interest rates and stock market valuations. As can be seen by the chart on the right, high interest rates tend to lead to lower market valuations (higher earnings yield) and vice versa.

The credit crisis of 2008 was an exception, as a systemic flight to safety in the capital markets (debt and equity) led to a sell-off of virtually all non-government securities and into Treasuries. This (along with a low federal funds rate) drove yields of long-term treasuries down to some of the lowest levels in history.



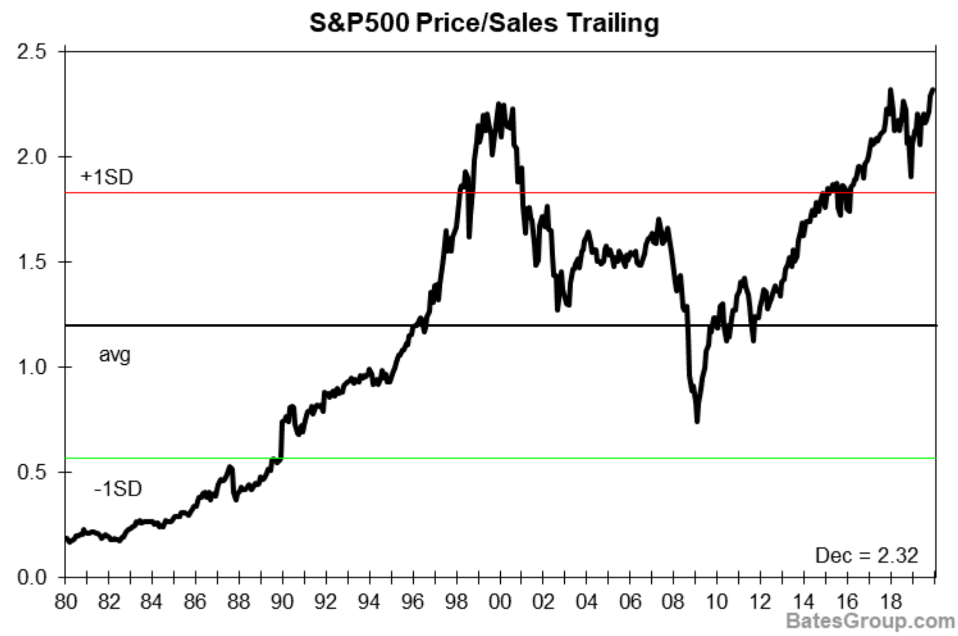
The yield gap measures the difference between the earnings yield for equities and bond yields. Extreme values can occur when stocks are overpriced (below the red line) or underpriced (above the green line) versus bonds. Currently equities appear cheap relative to bonds by this measure.

However, it's important to note that historically low interest rates following the credit crisis have skewed this metric in recent years.

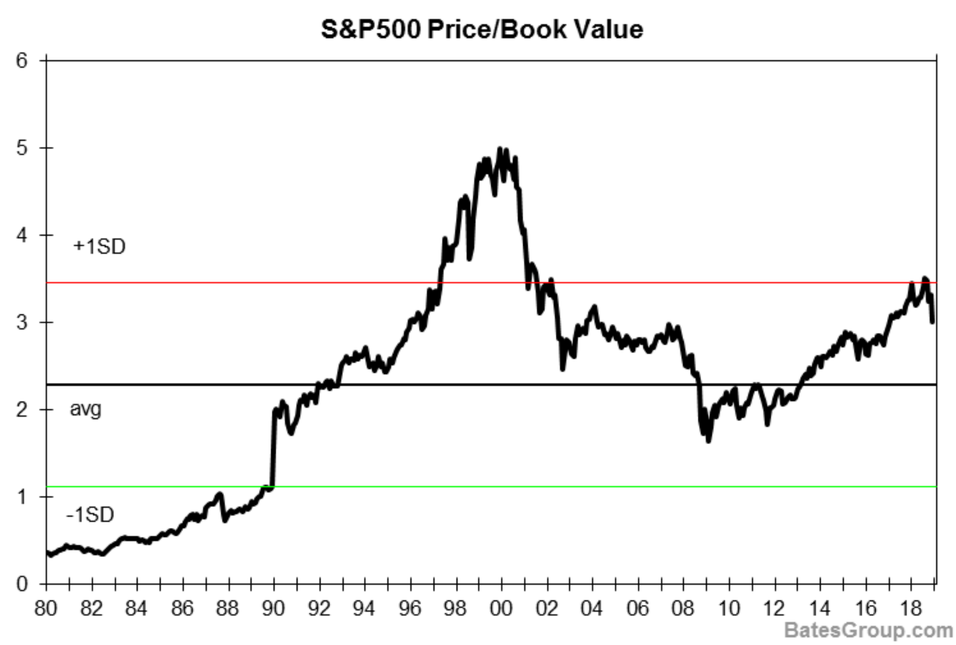


By one measure of equity market valuation, the S&P 500 is trading significantly above long-term average levels.

Currently, investors are paying 2.32 times sales for the broader market. The historic average has been 1.20x sales.



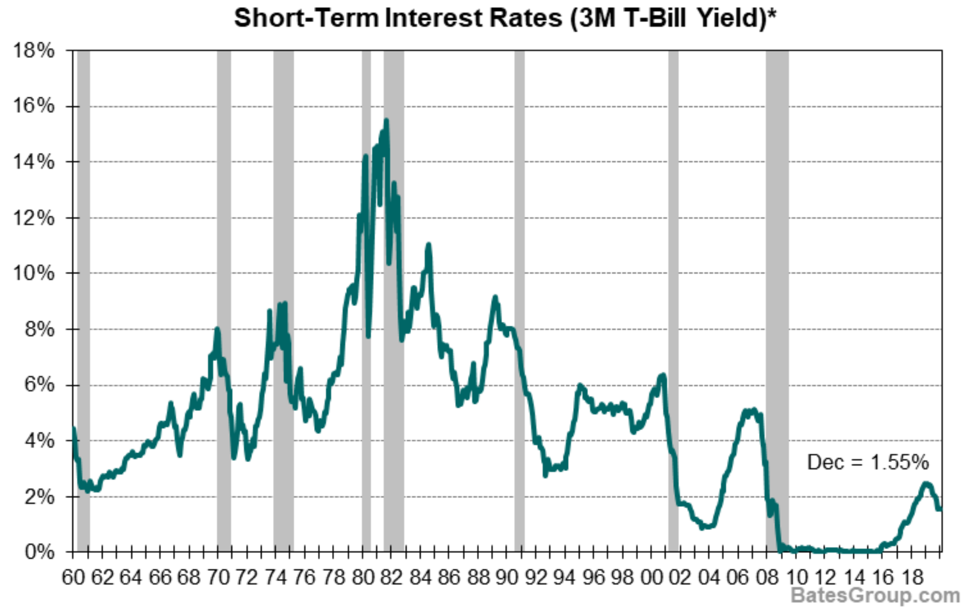
Price-to-book value is another common valuation metric. By this measure, the S&P 500 Index appears moderately overvalued.



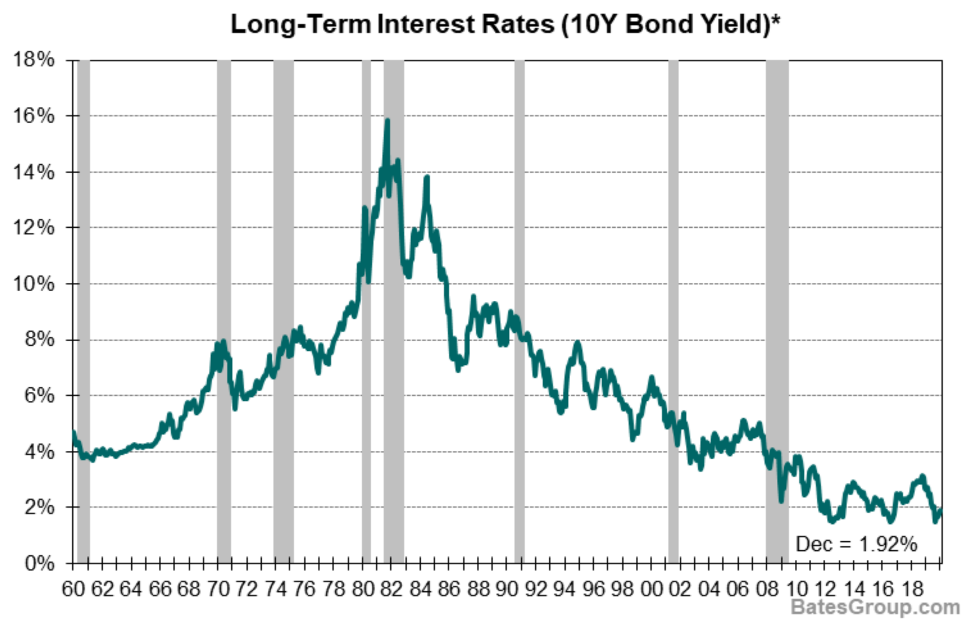
Credit Market Trends – Interest Rates

During the year, the yield on three-month Treasury bills fell from 2.45% at the end of 2018 to 1.55% at the end of last year.

In the wake of the collapse of Lehman Bros, the historic financial crisis and a massive flight to safety, three-month Treasury yields fell in late 2008 to the lowest levels ever experienced since World War II. Those historically low levels were maintained until 2016, when short rates began to briefly rise again before falling in 2019.



Long-term Treasury yields (10Y) fell in 2019 to finish the fourth quarter at 1.92%. This is down from 2.69% at the end of 2018.

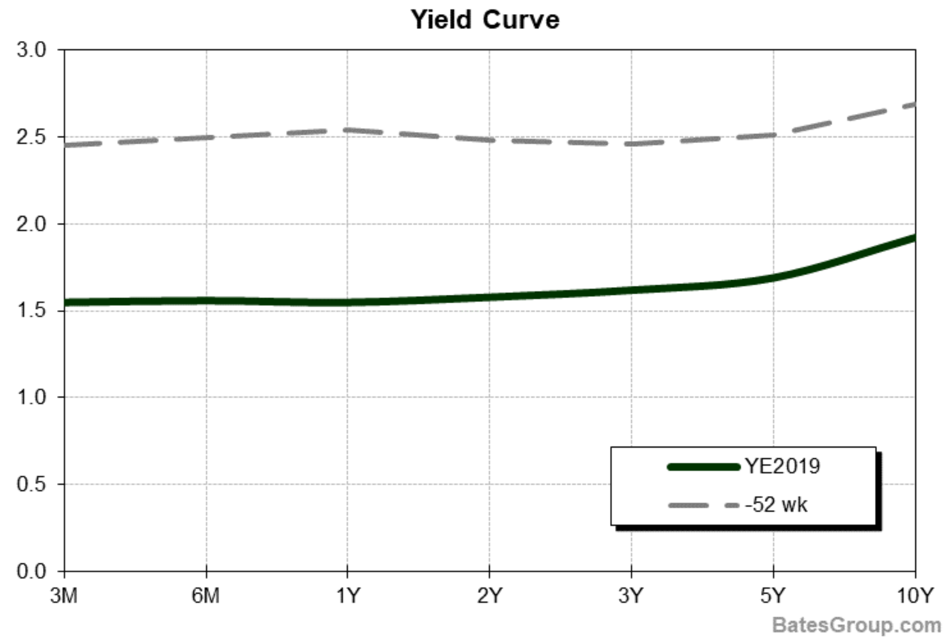


** Shaded areas represent recessions*
Source: Federal Reserve, Bloomberg, Pegasus Research

The yield curve was flat in the later part of 2019, indicating investors' belief that the economic outlook had weakened.

Historically, a flattened yield curve has indicated the end of an upward economic cycle.

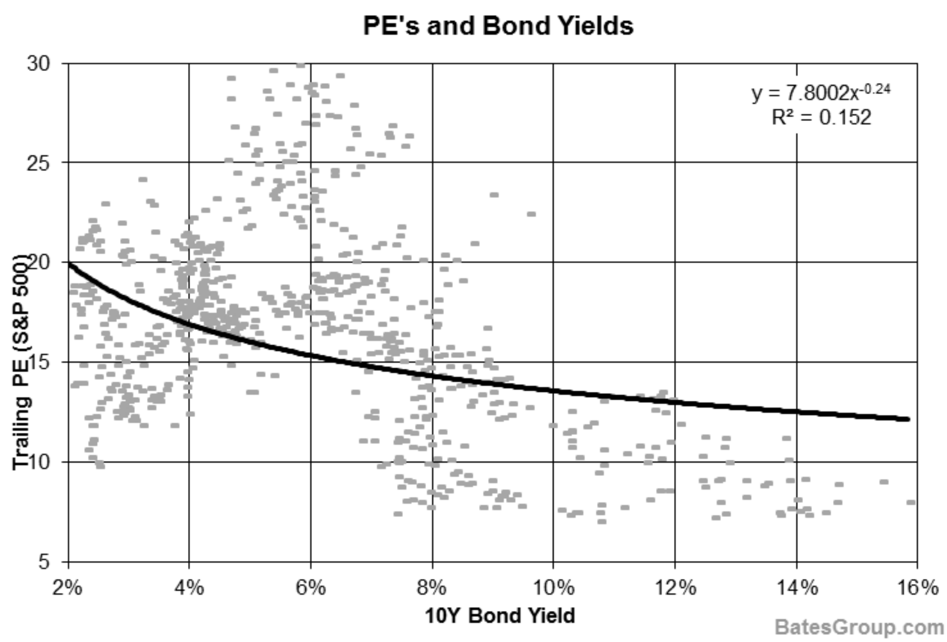
Of note, an inverted yield curve (short-term yields higher than long-term yields) has preceded each of the nine recessions since the 1950s.



Here is another view of the relationship between interest rates and equity valuations.

PEs tend to be higher when long-term rates are low and vice versa.

PE if interest rates:	<6%	6-9%	>9%
Low	9.8	7.3	7.0
Avg.	**17.8**	**16.5**	**10.2**
High	30.2	29.8	22.4
-1SD	13.7	11.5	15.3
+1SD	21.9	21.5	20.3



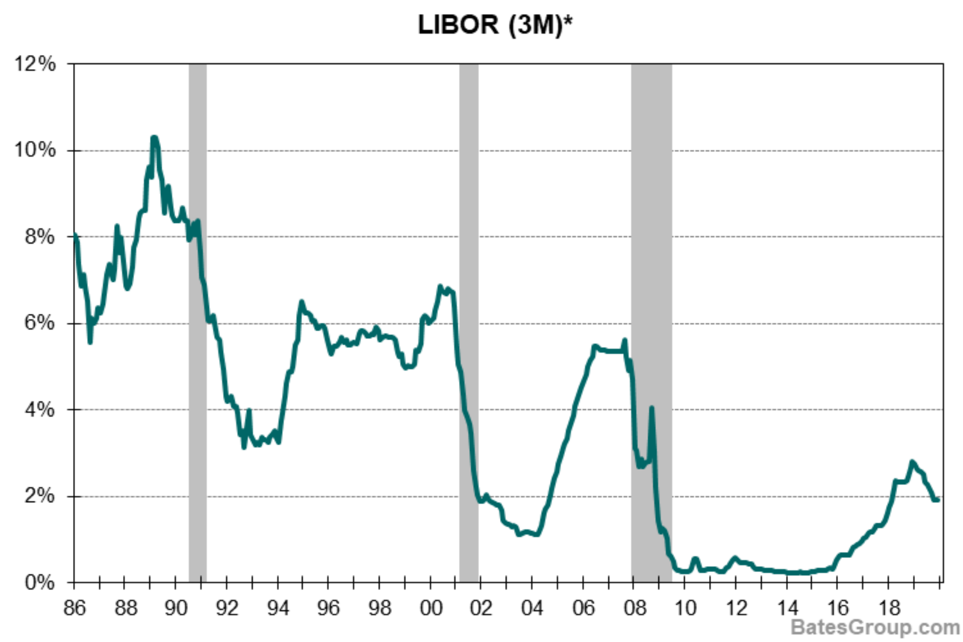
** Shaded areas represent recessions*

Source: Federal Reserve, Bloomberg, Pegasus Research

LIBOR & SOFR Rates

Three month forward LIBOR (London Interbank Offering Rate) declined in 2019, with the Eurodollar rate falling to 1.91% at year-end 2019 compared to 2.80% at the end of 2018.

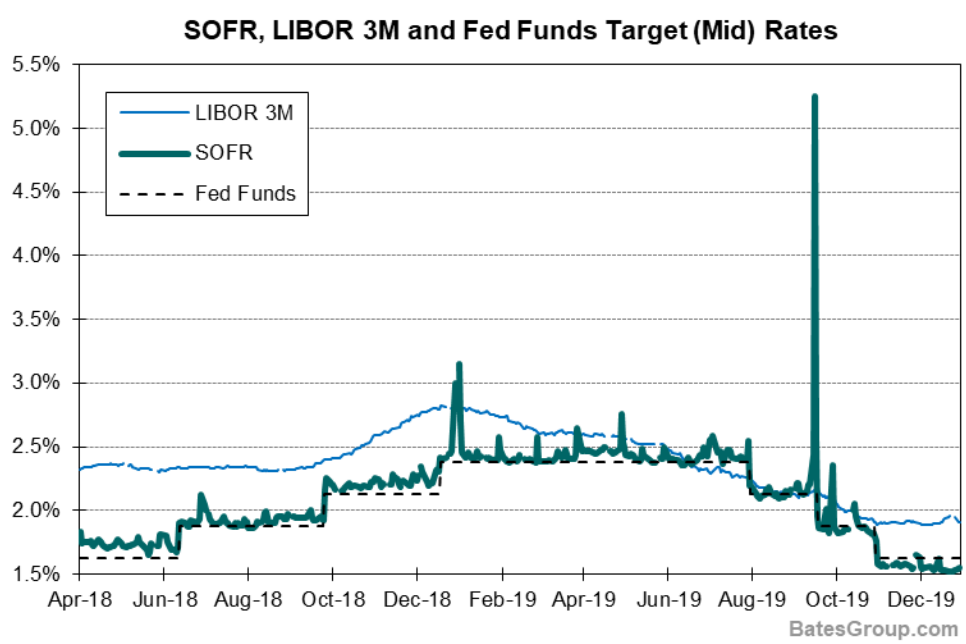
Volume in the underlying rates continue to remain light as world financial markets begin the transition to the end of LIBOR as a short-term reference rate in 2021.



In April 2018, SOFR (Secured Overnight Financing Rate) was introduced in the U.S. as an alternative to dollar-denominated LIBOR rates.

The major distinction between SOFR and LIBOR is that SOFR is based on actual overnight rates (secured by US Treasuries), while LIBOR is based on a survey of what banks would likely charge (unsecured) other banks for overnight lending.

Since launching in early April 2018, SOFR had closely tracked Federal Funds Target rates, with the exception of a spike in September 2019.

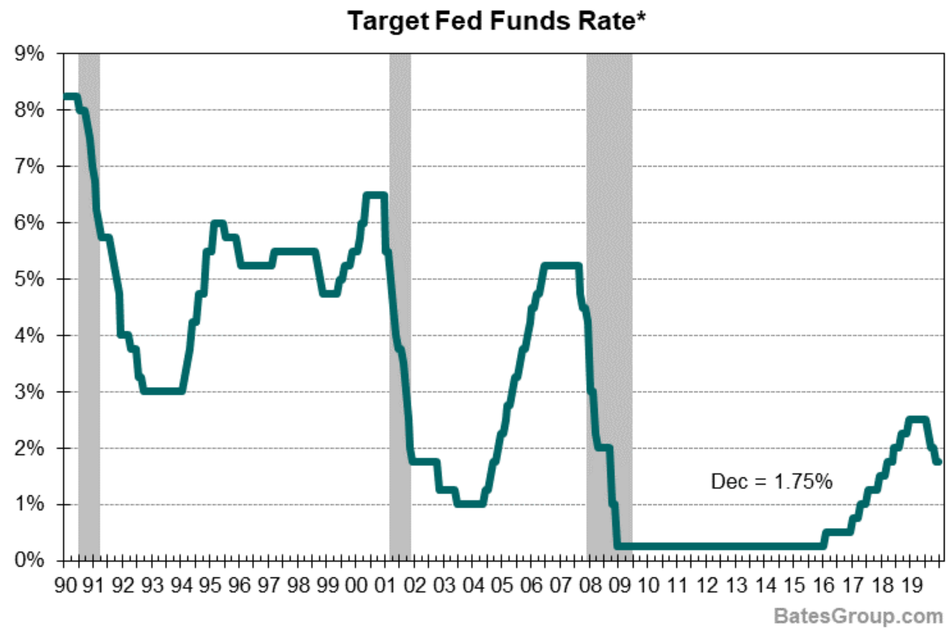


** Shaded areas represent recessions*
Source: Federal Reserve, Bloomberg, Bates Research

Federal Funds Rate

After briefly plateauing in 2018, the Federal Reserve began decreasing rates again in 2019 as “uncertainties about this [economic] outlook remain.”

The target federal funds rate still remain well below the funds rate during previous periods of mature economic expansion



Changes in the Federal Funds Rate (2000-2018)

	Change (basis points)		
Date	**(+)**	**(-)**	**Level (%)**
2019			
Oct 31	…	25	1.50-1.75
Sep 19	…	25	1.75-2.00
Aug 1	…	25	2.00-2.25
2018			
Dec 20	25	…	2.25-2.50
Sep 27	25		2.00-2.25
Jun 14	25	...	1.75-2.00
Mar 22	25	...	1.50-1.75
2017			
Dec 14	25	…	1.25-1.50
Jun 15	25	…	1.00-1.25
Mar 16	25	…	0.75-1.00
2016			
Dec 15	25	…	0.50-0.75
2015			
Dec 15	25	…	0.25-0.50

	Change (basis points)		
Date	**(+)**	**(-)**	**Level (%)**
2008			
Dec 16	…	75-100	0.00-0.25
Oct 29	…	50	1.00
Oct 8	…	50	1.50
Apr 30	…	25	2.00
Mar 18	…	75	2.25
Jan 30	…	50	3.00
Jan 22	…	75	3.50
2007			
Dec 11	…	25	4.25
Oct 31	…	25	4.50
Sep 18	…	50	4.75
2006			
Jun 29	25	…	5.25
May 10	25	…	5.00
Mar 28	25	…	4.75

	Change (basis points)		
Date	**(-)**	**(+)**	**Level (%)**
Jan 31	25	…	4.50
2005			
Dec 13	25	…	4.25
Nov 1	25	…	4.00
Sep 20	25	…	3.75
Aug 9	25	…	3.50
Jun 30	25	…	3.25
May 3	25	…	3.00
Mar 22	25	…	2.75
Feb 2	25	…	2.50
2004			
Dec 14	25	…	2.25
Nov 10	25	…	2.00
Sep 21	25	…	1.75
Aug 10	25	…	1.50
Jun 30	25	...	1.25

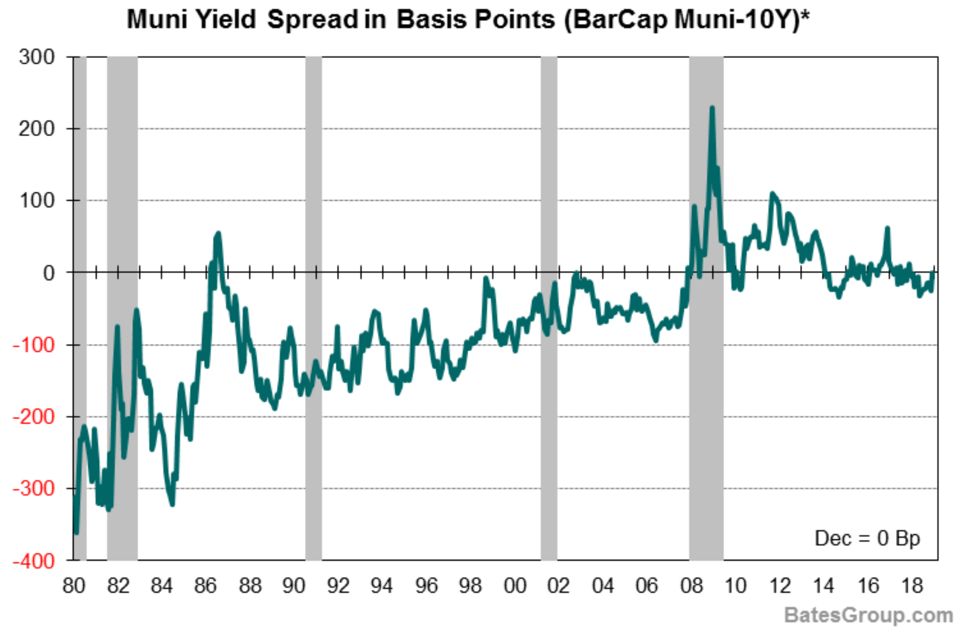
** Shaded areas represent recessions*
Source: Federal Reserve, Bloomberg, Pegasus Research

Municipal Bonds

Municipal bond performance was positive in 2019, with the S&P Municipal Bond Index up 7.26%.

Yields continued to fall in 2019, however, with investment grade municipal bonds yielding 1.71% at year-end 2019 compared to 2.60% a year earlier.

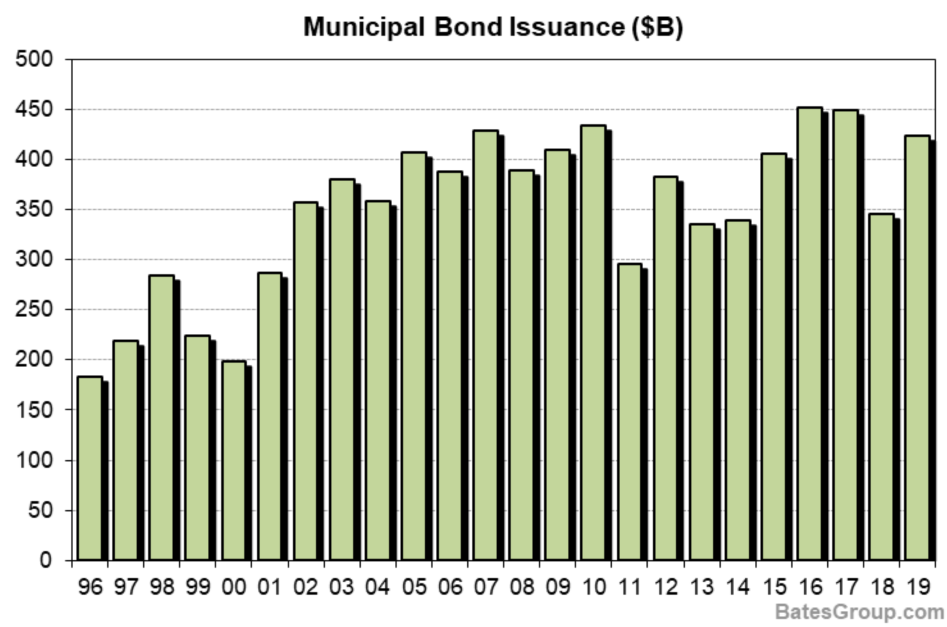
High yield municipal bond yields declined 119 basis points to 3.61%.



Municipal bond issuance increased 22.3% in 2019 to $423.4 billion.

The increase in issuance was due to a number of positive factors including low default rate levels and increased municipal revenues.

Revenue bonds accounted for 38% of municipal bonds issued in 2019, up slightly from 35% in 2018.

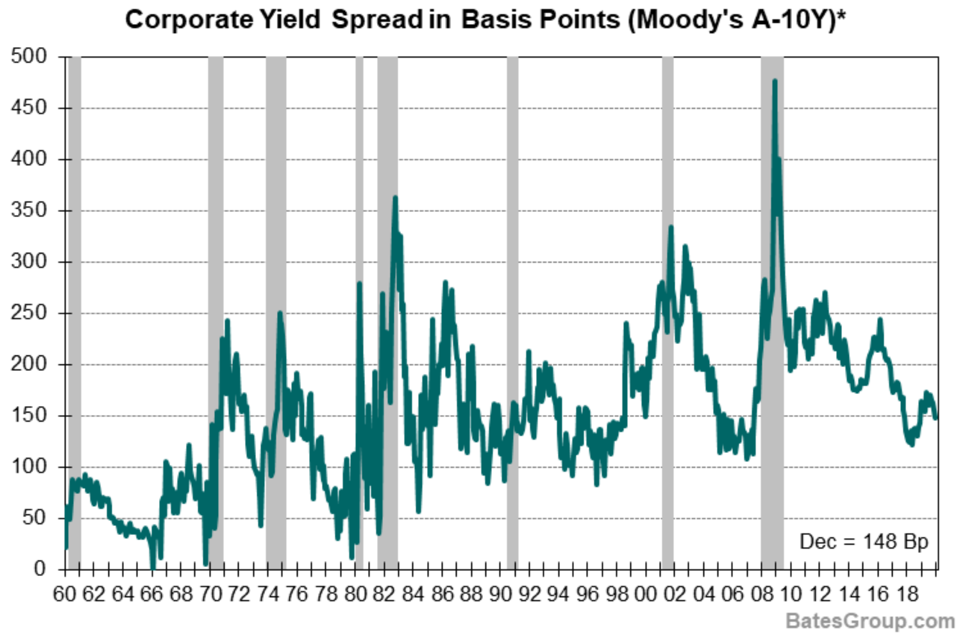


** Shaded areas represent recessions*
Source: Bloomberg, SIFMA, Standard & Poor's, Thomson Reuters, MSRB

Corporate Bonds

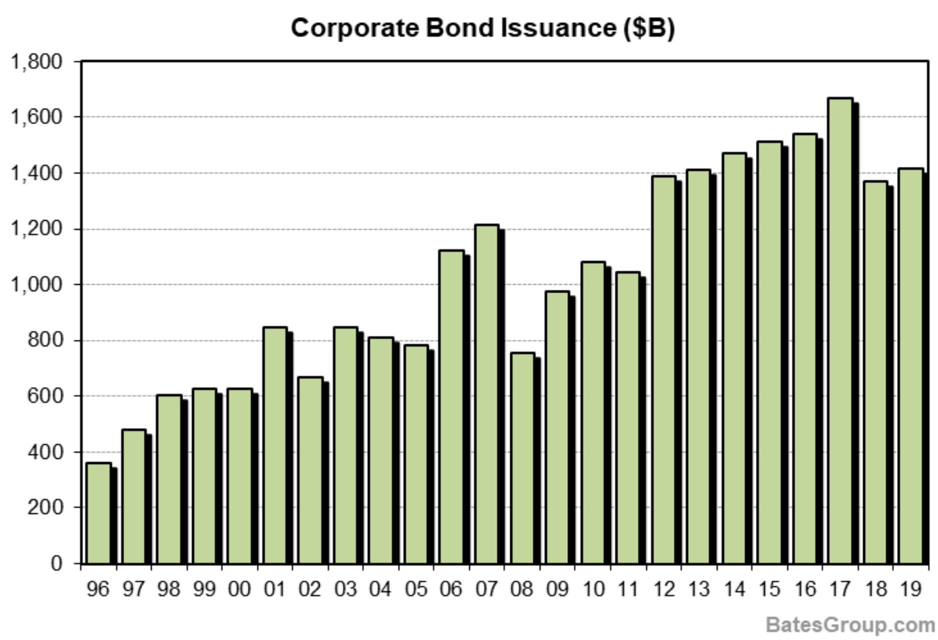
U.S. corporate bond spreads declined during the last seven months of 2019 with the spread on Moody's A-rated Bond Index closing the year at 148 basis points. This compares to a risk spread of 172 basis points in May.

The quality spread between Aaa-rated bonds and Baa-rated bonds also declined during the year, with the spread declining from 133 basis points in January to 84 basis points at the end of December.



U.S. corporate bond issuance totaled $1,416 billion in 2019, up only 3.2% from the prior year.

Investment-grade corporate debt issuance declined marginally during the year, down 2.3%, while high yield debt issuance climbed.

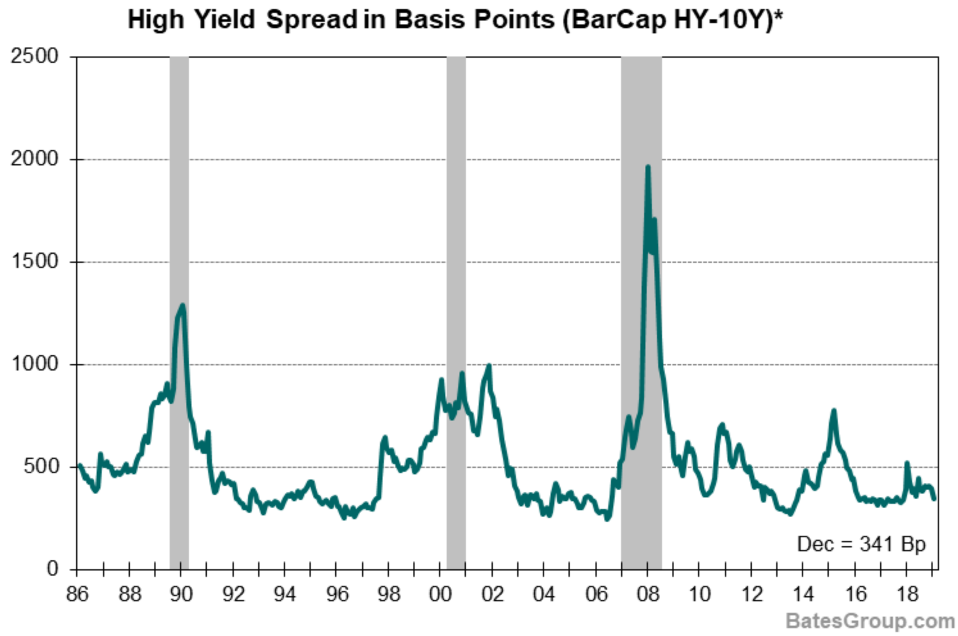


** Shaded areas represent recessions*
Source: Bloomberg, Thomson Reuters, SIFMA

High Yield Securities

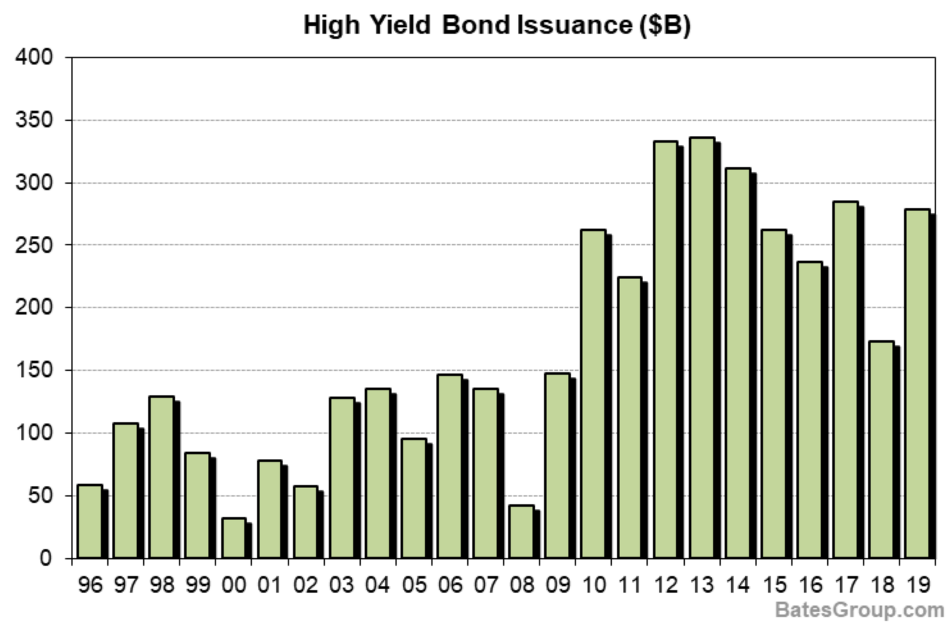
High yield bond spreads declined during the year, falling to 341 basis points at the end of December 2019 compared to 520 basis points a year earlier.

The 12-month trailing U.S. corporate speculative-grade default rate closed the year at 4.2%, up significantly from 2.8% at the end of 2018.



High yield issuance was up significantly in 2019 compared to the previous year, with $278.3 billion being issued last year compared to $169.4 billion in 2018.

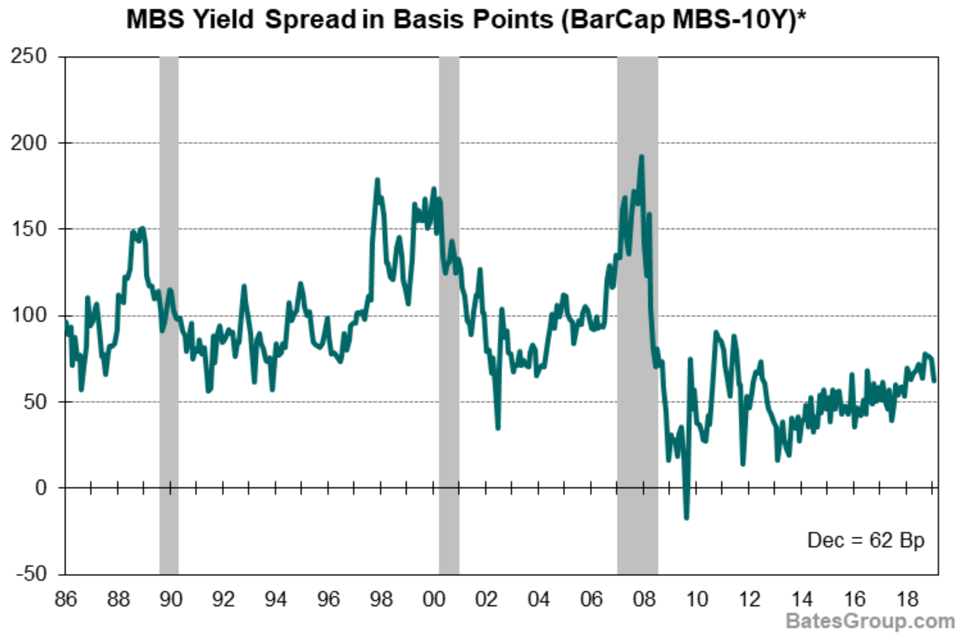
Much of the growth in issuance was driven by investors' search for yield in a low yield environment.



** Shaded areas represent recessions*
Source: Bloomberg, Moody's, SIFMA, Standard & Poors

Mortgage-Backed Securities

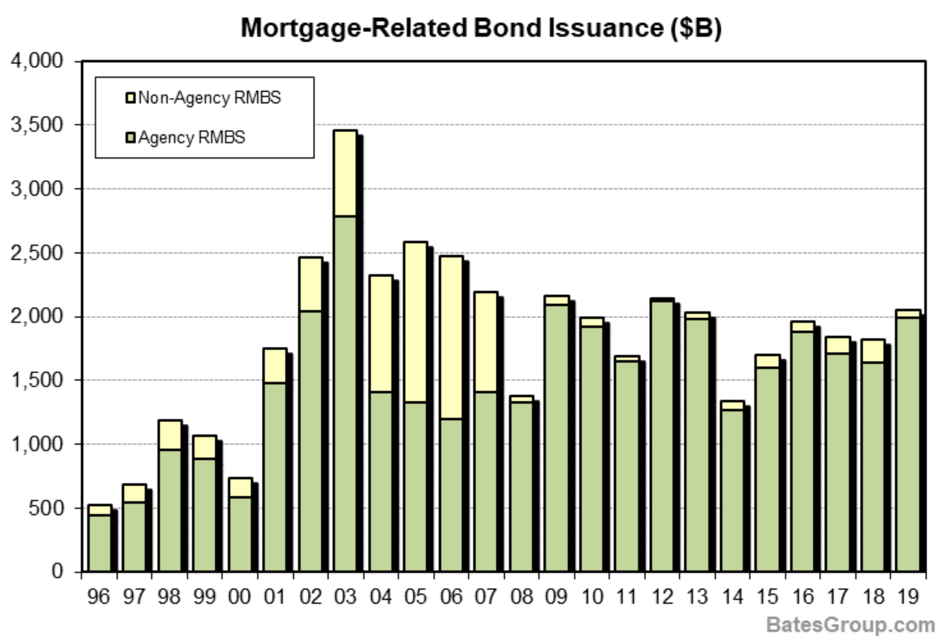
MBS yield spreads declined slightly in 2019, falling to 62 basis points at the end of December compared to 70 basis points a year earlier.



Mortgage-related bond issuance totaled $2,110 billion in 2019, up 10.7% from the prior year.

For the entire year, agency RMBS issuance was up 21.8% to $1,992 billion while non-agency RMBS issuance was down 63.7% to $64 billion.

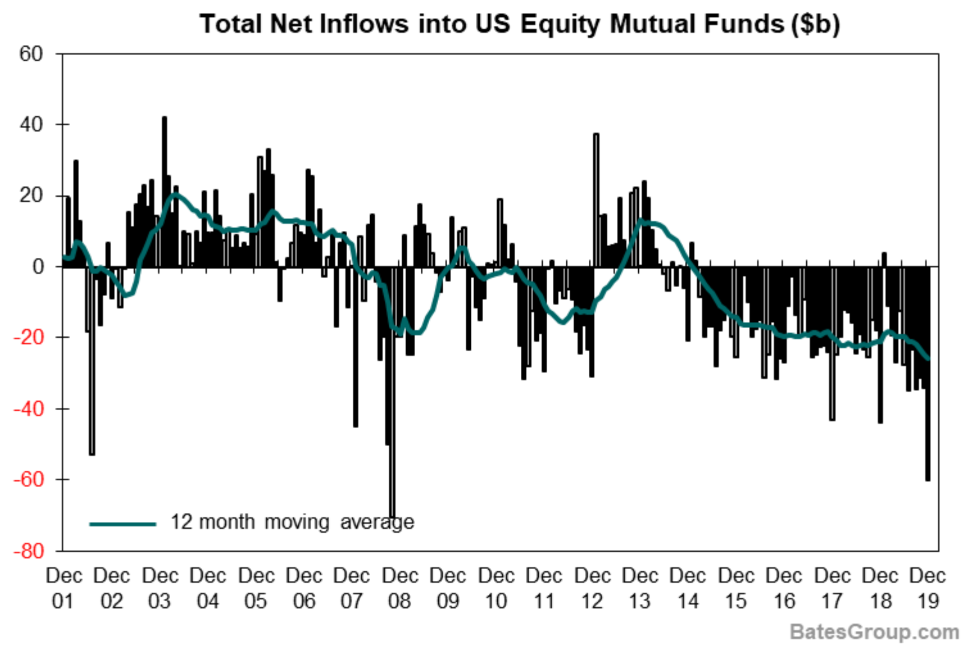
CMBS issuance in 2019 was $54.4 billion, down from 2018's $88.7 billion in issuance.



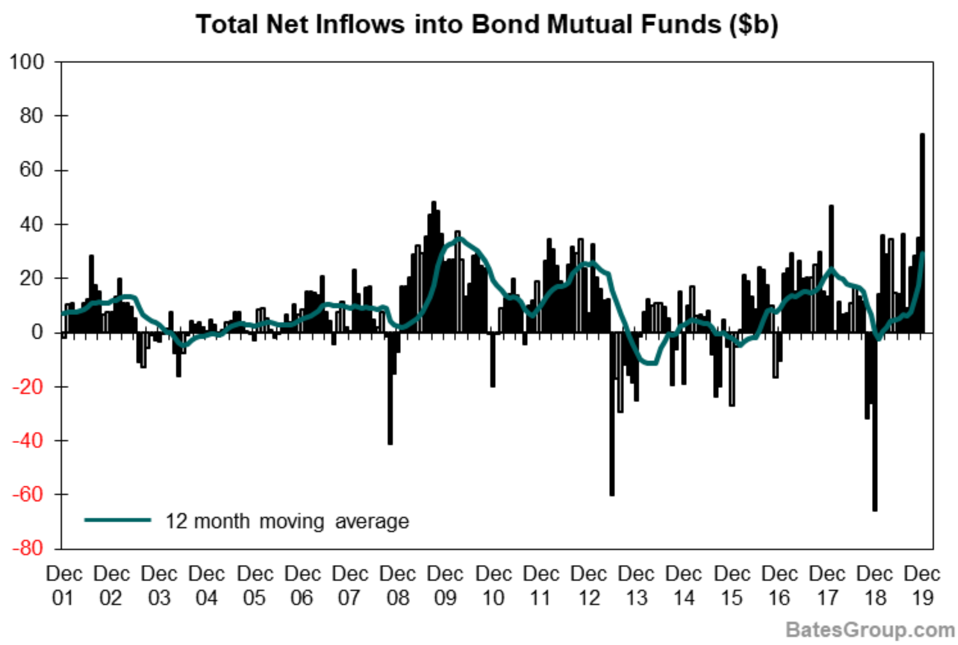
** Shaded areas represent recessions*
Source: Bloomberg, Thomson Reuters, SIFMA

Mutual Fund Flows

In 2019, money continued to flow out of equity mutual funds. Net outflows for the year totaled $311 billion.

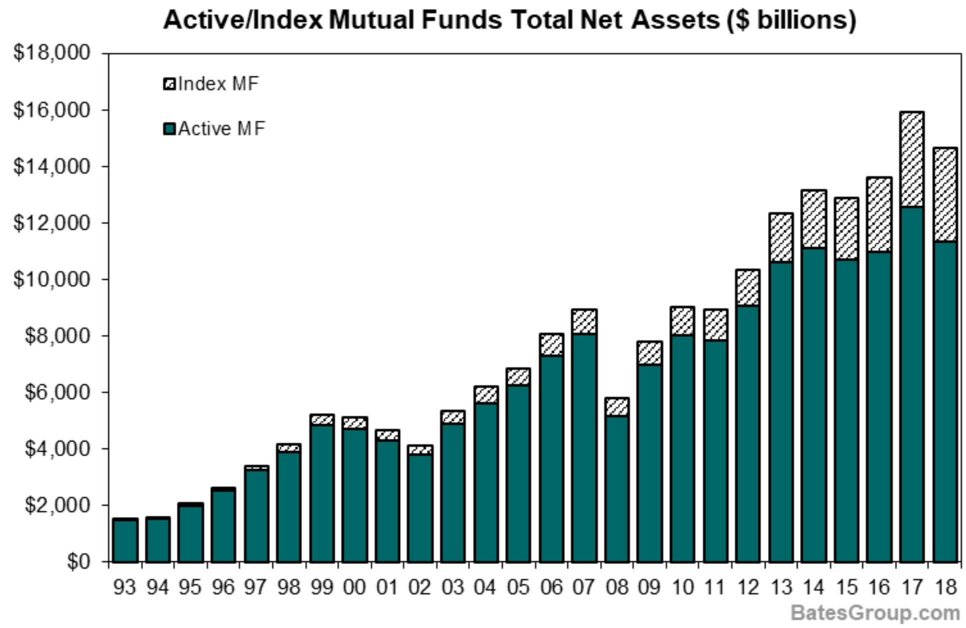


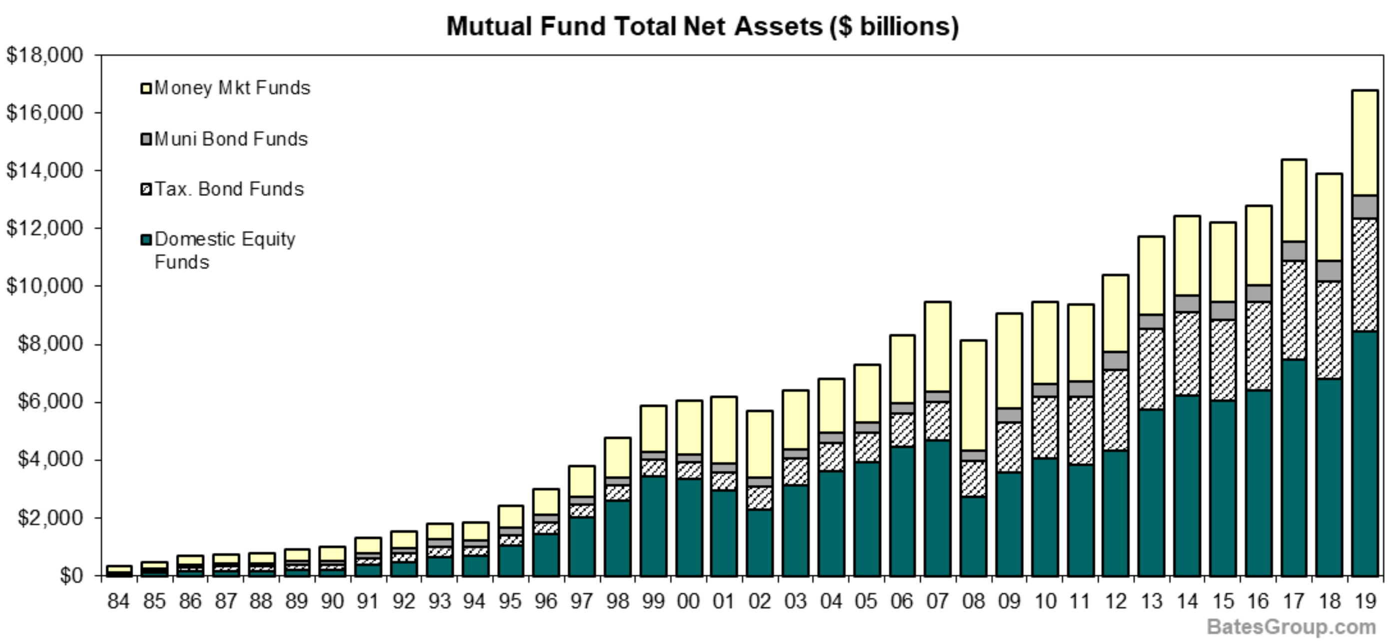
Bond funds received net inflows of $349 billion in 2019. In December alone, nearly $74 billion flowed into bond mutual funds.



Source: Investment Company Institute

In terms of total net assets, actively managed mutual funds accounted for 77% of all mutual funds, compared to just 13% for indexed funds.



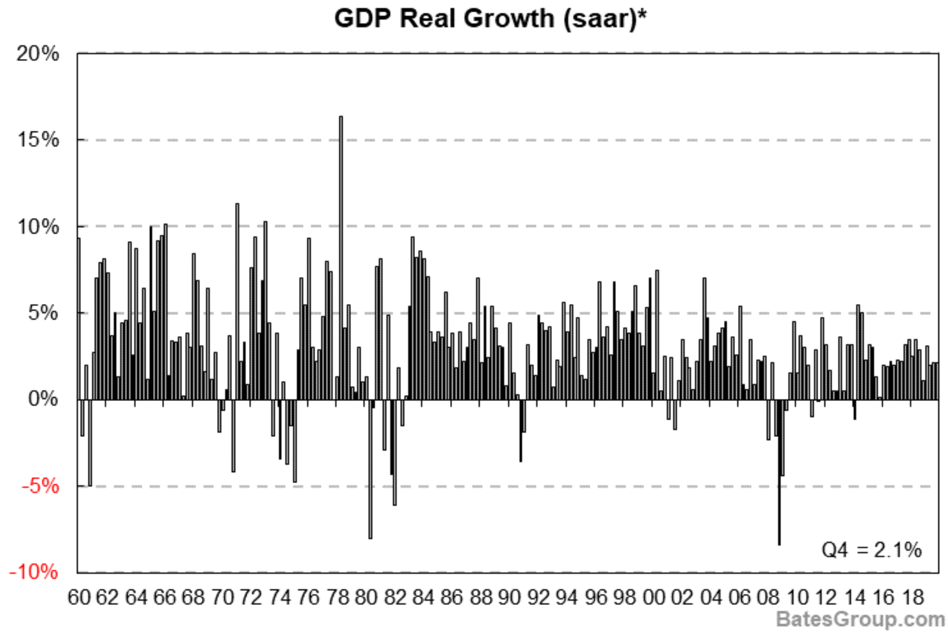


Source: Investment Company Institute

The Economy

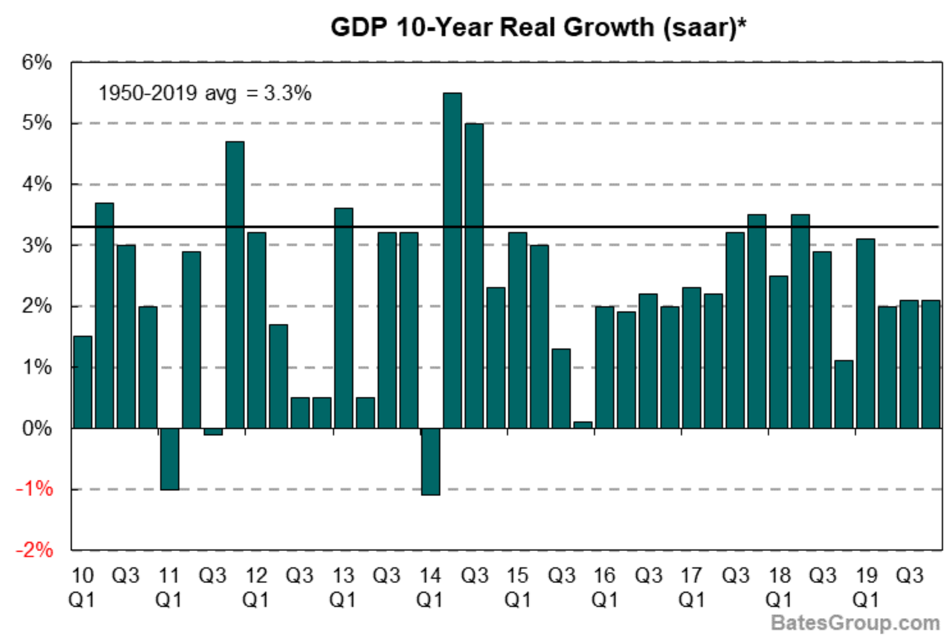
The "second" estimate of U.S. GDP showed the economy growing at an annual rate of 2.1% in the fourth quarter of 2019. For the year, GDP advanced 2.3%. Much of the growth in the fourth quarter was primarily attributable to increases in government spending, which increased at a 2.6% annual rate in Q4.

Business investment experienced a third consecutive quarter of declines with gross private investment down at a 6.0% annual rate in Q4.



Since coming out of the Great Recession of 2008-09, there have been just six quarters of economic growth greater than the long-term average of 3.3%.

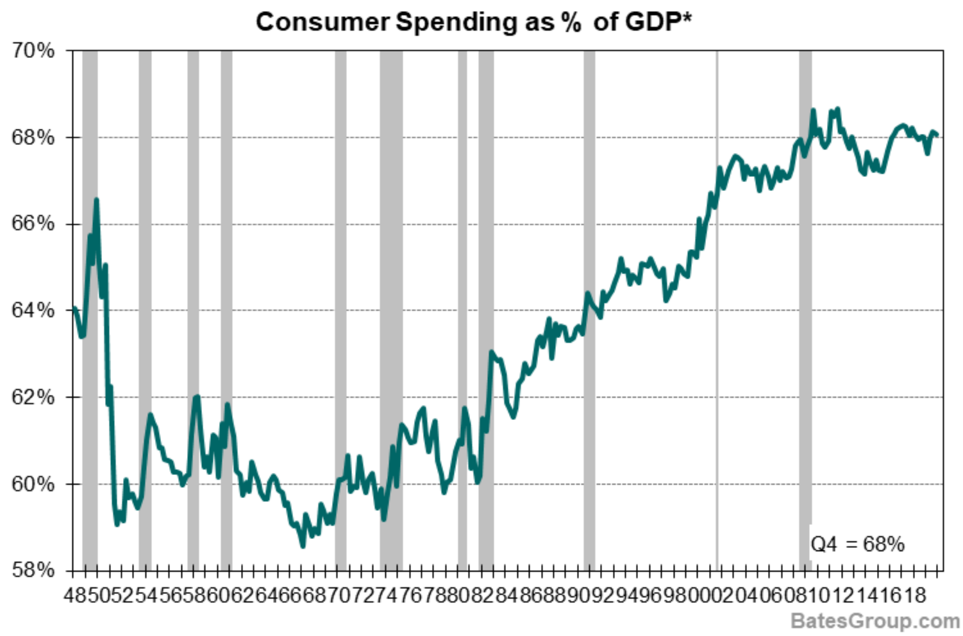
Over the past three years, the economy has struggled to grow at the long-term average, exceeding it only in two out of 12 quarters.



** saar – seasonally adjusted annual rate*
Source: Bureau of Economic Analysis, National Bureau of Economic Research

Consumer spending increased at a 1.7% annual rate in the fourth quarter, weaker than many economists had expected.

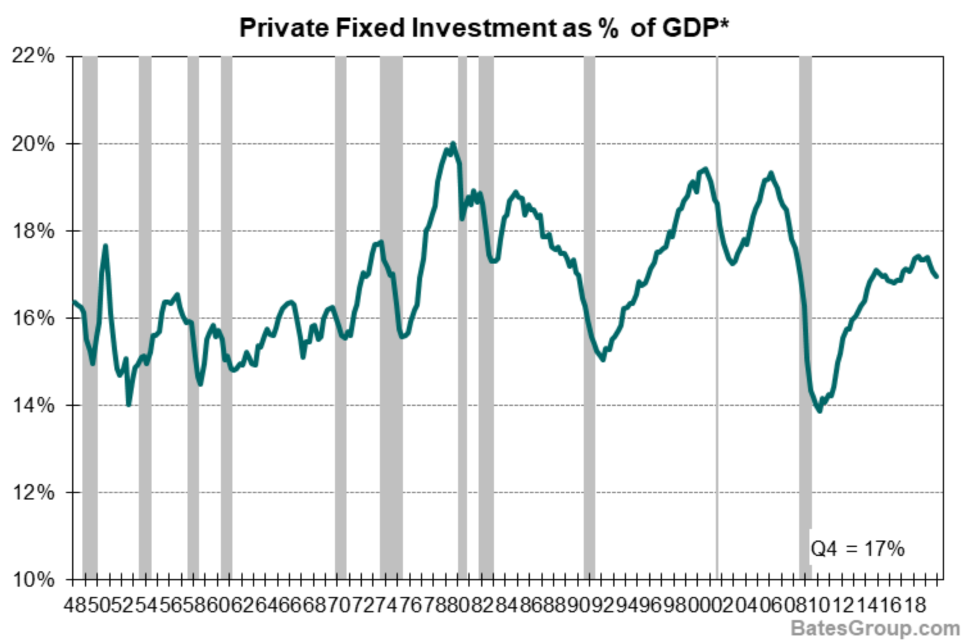
Consumer spending is still the largest component of economic growth. As a percentage of GDP, personal consumption expenditures (PCE) remained steady at 68.0%.



During the Great Recession, companies reigned in their spending to a level not previously experienced in the post-WWII economy.

Over the past few years, companies have been moderately increasing their spending, although it is still below the levels experienced in prior economic recoveries.

Private fixed investment continued to decline in the last quarter of the year and accounted for 17% of GDP in Q4.



** Shaded areas represent recessions*
Source: Bureau of Economic Analysis

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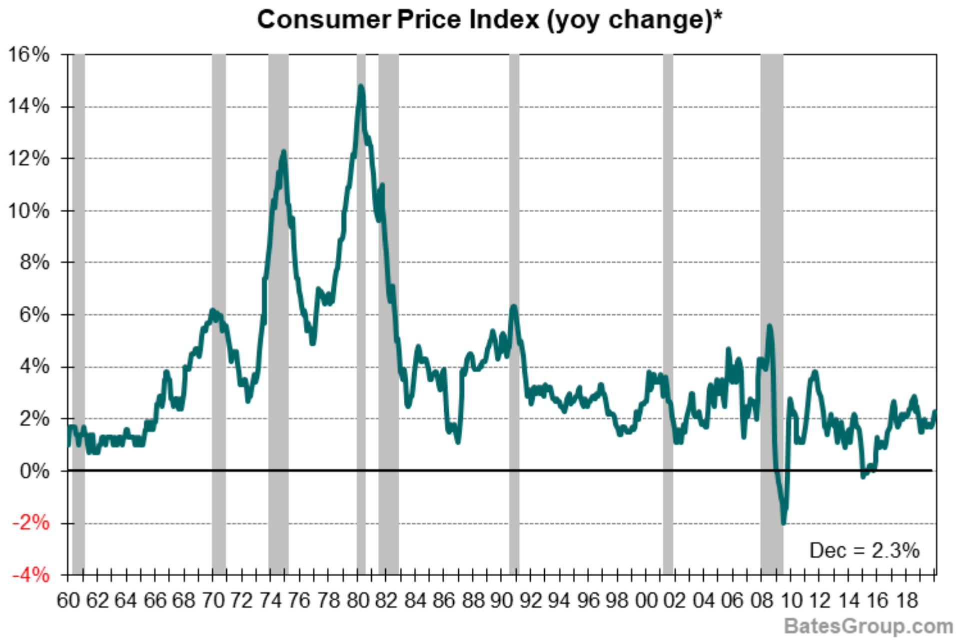
Inflation

In 2019 inflation remained tame, with prices rising 2.3% for the 12 months ended December.

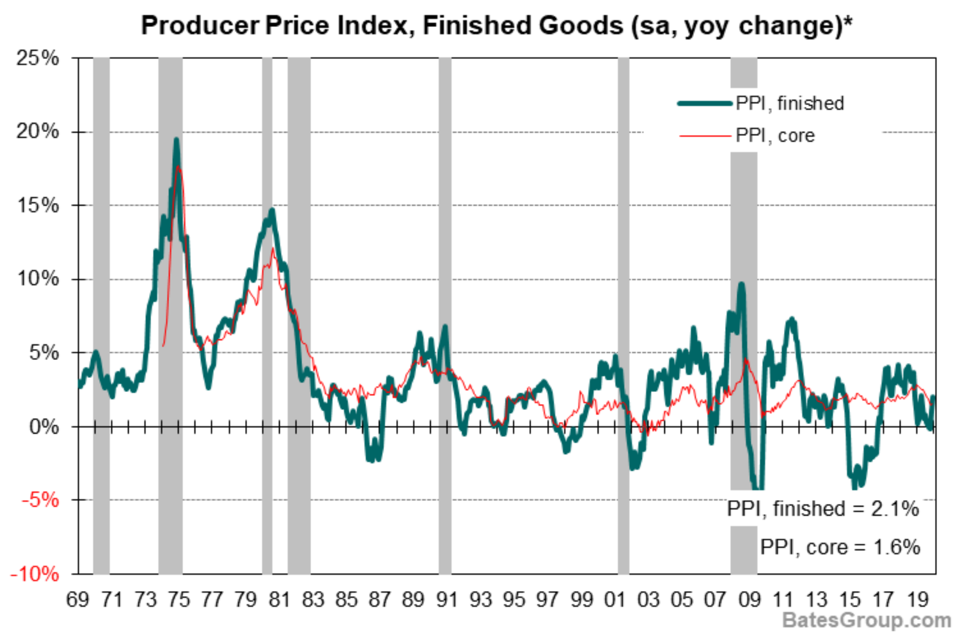
The modest increase in the top line CPI number was primarily due to an increase in gasoline prices, which rose 2.8% in December. For the 12 months ended December 2019, gasoline prices rose 7.4%.

Excluding volatile food and energy prices, core rate inflation rose 0.1% in December, with the 12-month core rate climbing to 2.3%.



Producer prices for final demand softened in 2019, ending the year at a 2.1% annual rate.

The 12-month core PPI rate (final demand finished goods less foods and energy) was 1.6% in December compared to 2.8% in December 2018.



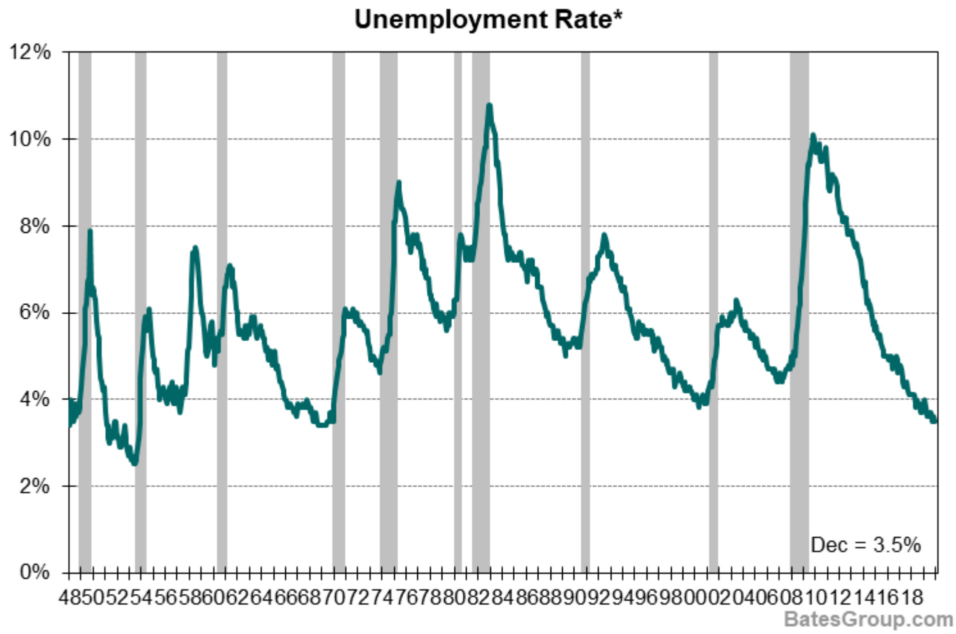
** Shaded areas represent recessions*
Source: Bureau of Labor Statistics

Employment

The top-line unemployment number continued to decline through 2019, ending the year at 3.5%. As is typical for a fourth quarter, the strongest increase in employment was in the retail sector as stores hired temporary workers for the holiday season.

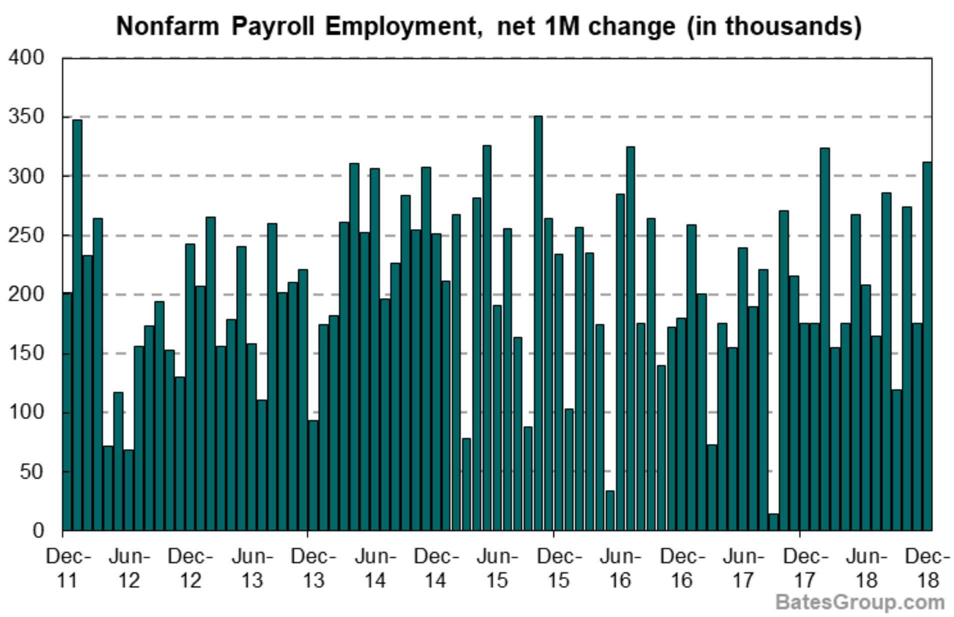
Health care employment was also strong in December along with the leisure and hospitality industries.

Mining employment was weak, with employment declining by 24,000.



Total non-farm payroll rose by 145,000 in December and averaged 175,000 per month in 2019.

Over the past three years (2017-2019 the average monthly gain was 192,778 compared to 223,694 for the prior three years (2014-2016).



** Shaded areas represent recessions*
Source: Bureau of Labor Statistics

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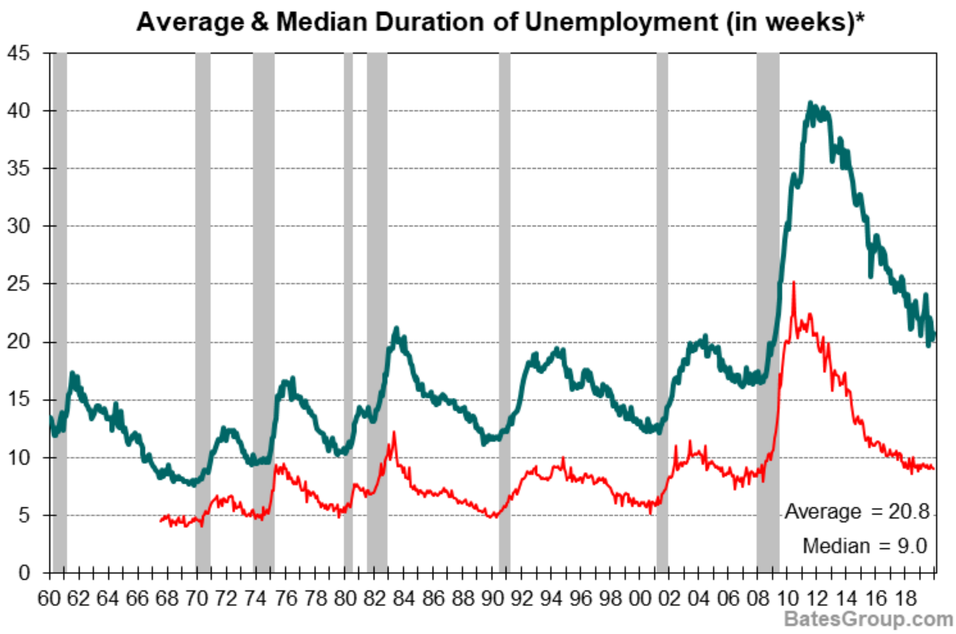
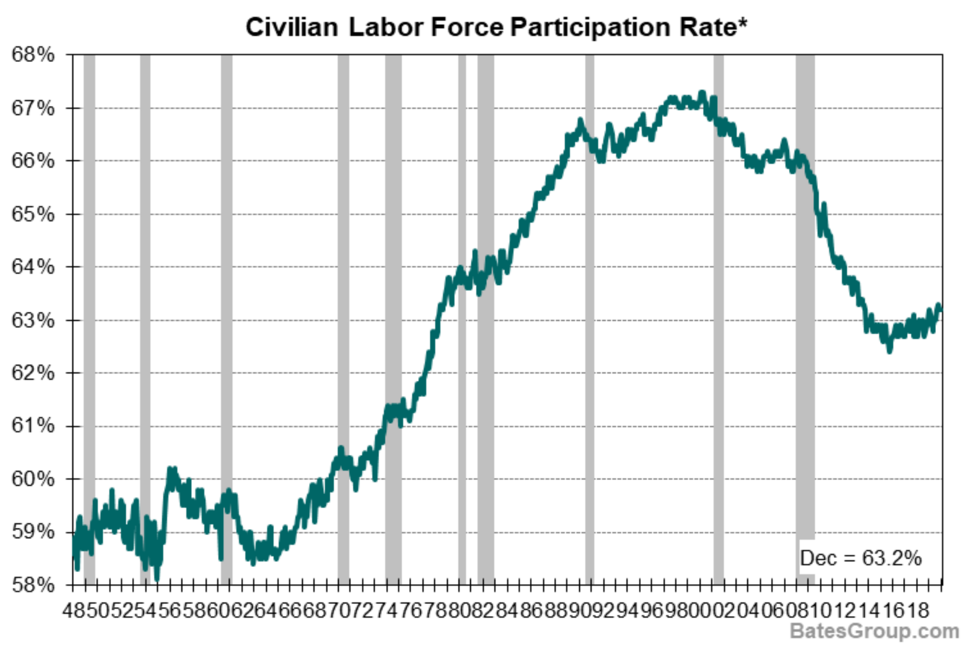
Although the length of time people remained unemployed declined from the peak set in 2010, the average duration of unemployment at 20.8 weeks was still much longer than during any other jobs downturn in the post-WWII era.



The civilian labor force participation rate was 63.2% in December, relatively unchanged for much of the prior two years.

The rate has declined from the 1980-2000 period in large part due to secular changes. Beginning in the 2000s, baby boomers began reaching retirement age and started dropping out of the labor force.

However, other changes also account for the decline. Life cycle or generational changes have recently led to less men participating in the labor force compared to earlier generations.

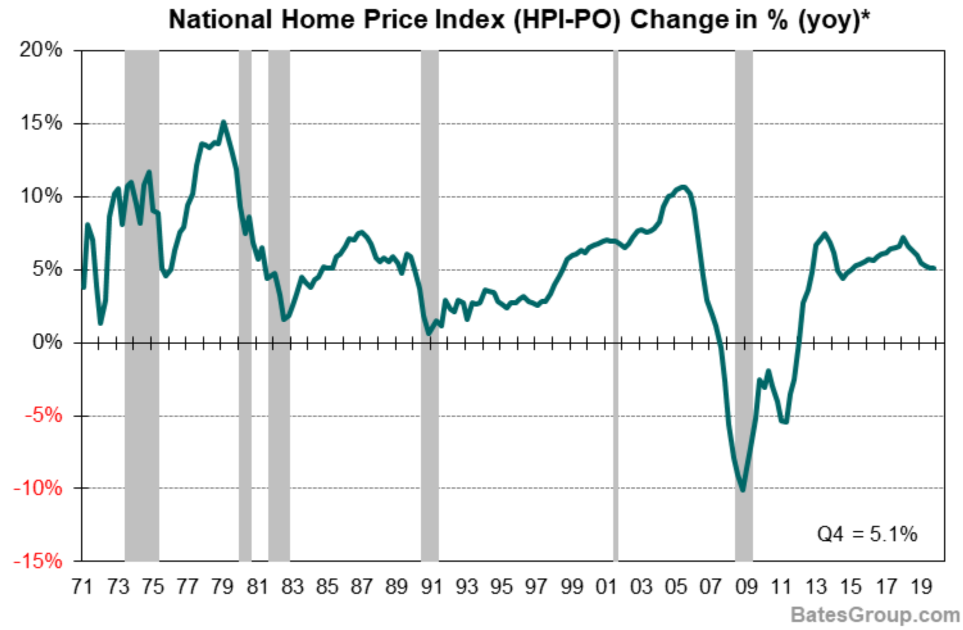


** Shaded areas represent recessions*
Source: Bureau of Labor Statistics

Housing

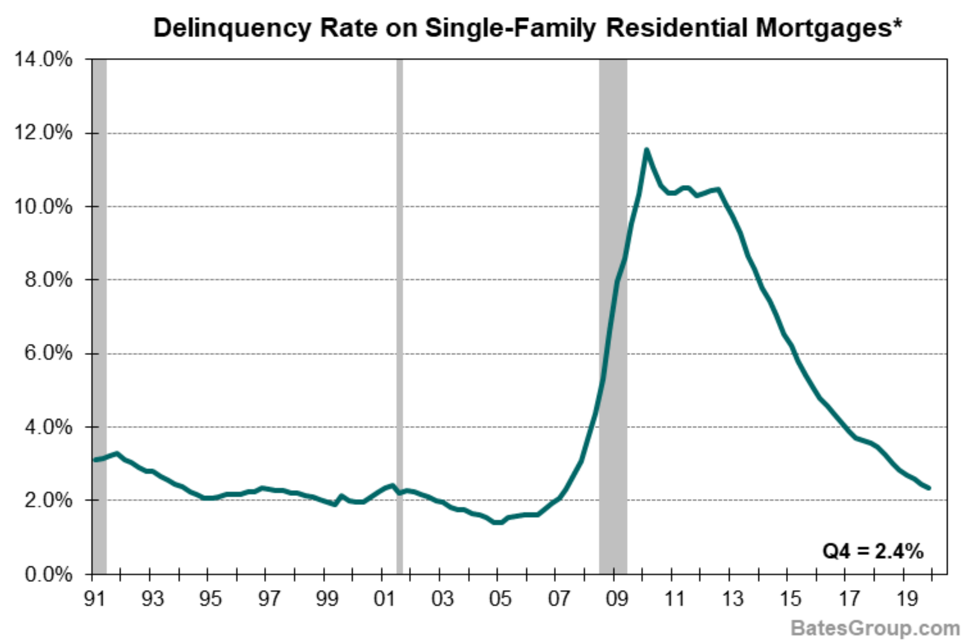
Housing price appreciation (purchases only) continued to show gains, rising 5.1% year-over-year (yoy) in the fourth quarter of 2019.

Of the nine census divisions, the Mountain region experienced the strongest fourth quarter gains, up 6.7% yoy. The weakest division was New England where prices rose 3.9% yoy in Q4 2019.



Delinquency rates on single-family residential mortgages continued to trend down, ending Q4 at 2.35%. Delinquency rates on farmland was a modest 2.34% at year-end 2019.

Fannie Mae's serious delinquency rate for single-family homes was 0.66% in December 2019 compared to 0.76% a year previously.



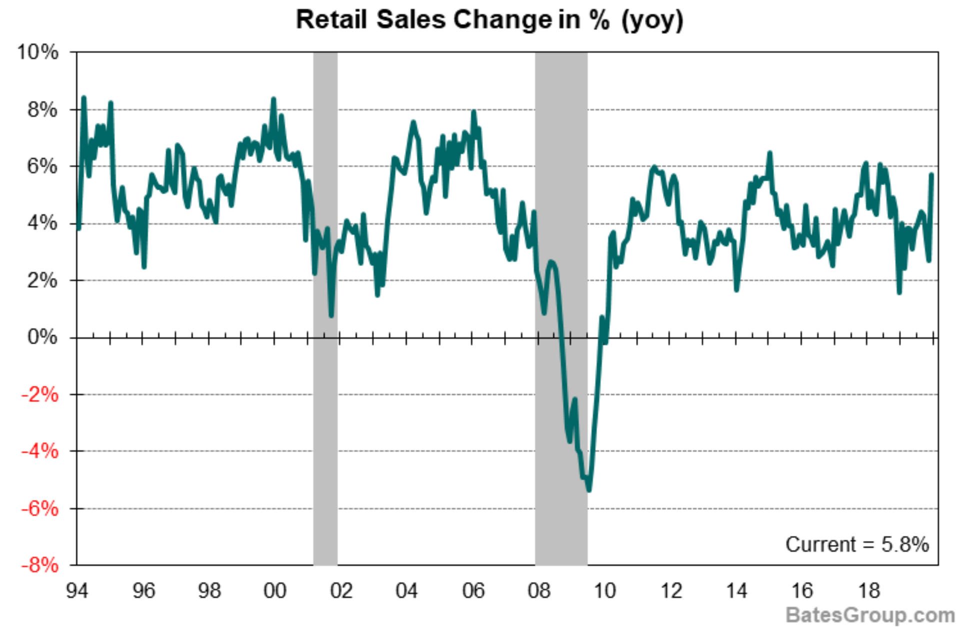
** Shaded areas represent recessions*
Source: FHFA, Federal Reserve, Bloomberg, Mortgage Bankers Association

The Consumer

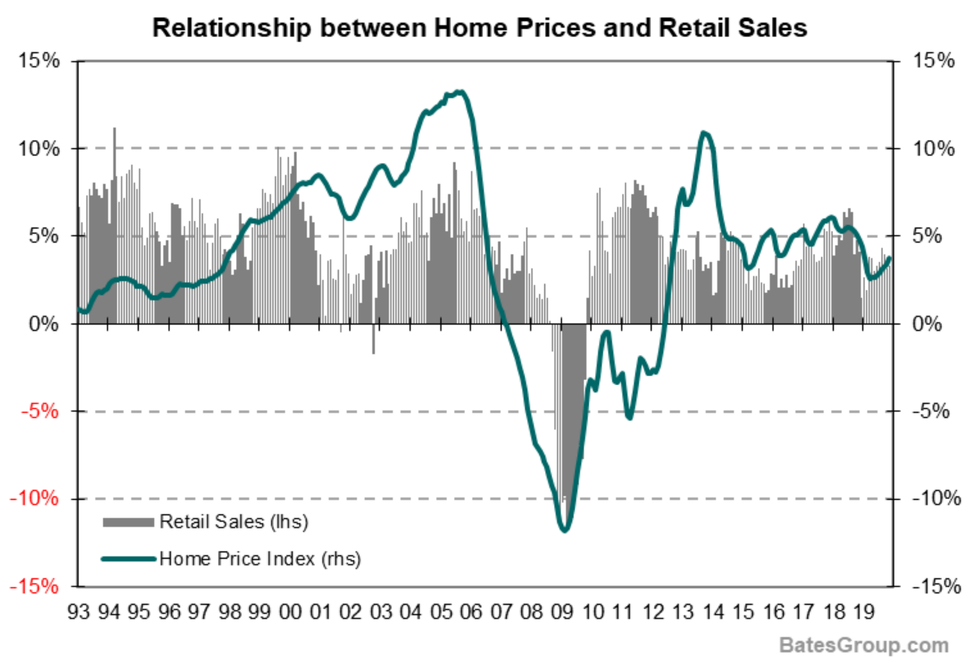
In the last month of 2019, the advance estimate of retail sales increased 0.3% over the previous month. Year-over-year (yoy) retail sales increased an estimated 5.8%.

On a 12-month basis, non-store retailers (electronic, mail-order, home delivery, etc) were up 13.1% yoy.

Department store sales continued to remain weak, down 5.5% in December 2019 compared to a year earlier.



The chart to the right shows the relationship between home prices and retail sales.

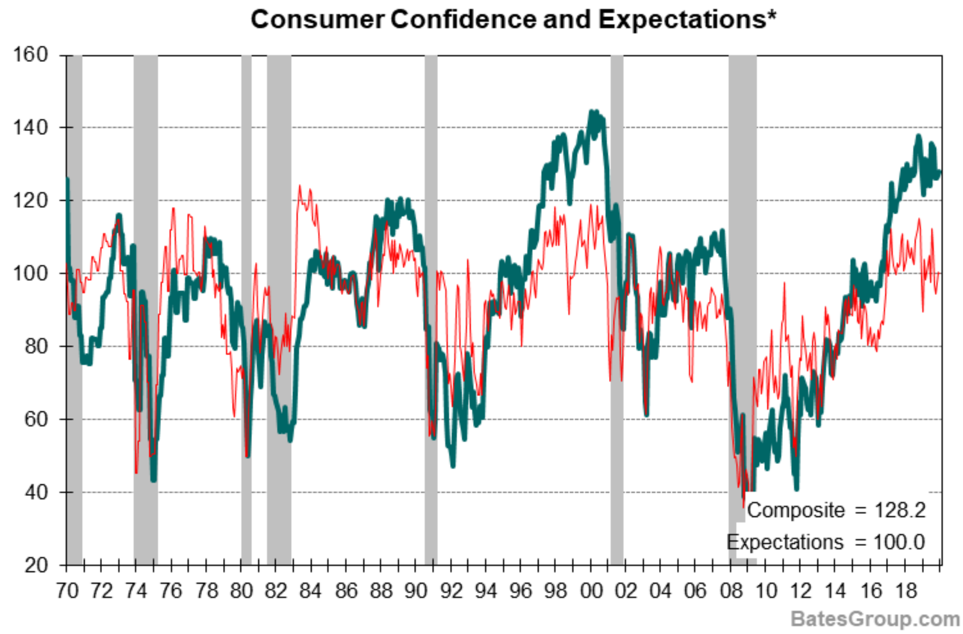


** Shaded areas represent recessions*
Source: U.S. Census Bureau, FHFA

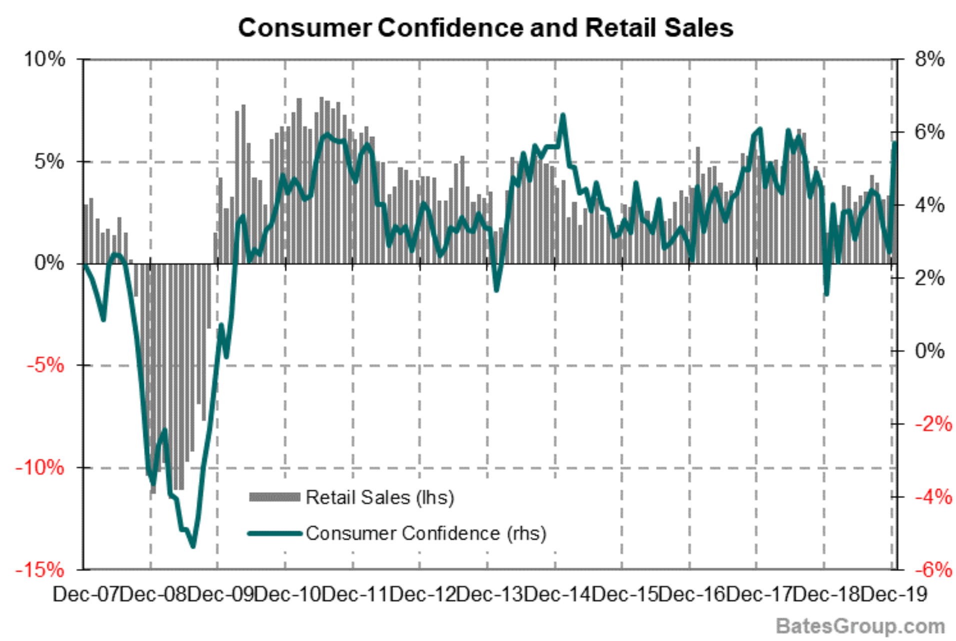
Consumer confidence continued to remain solid in the last quarter of 2019, with the index at 128.2 in December, almost unchanged from the previous year.

Consumer expectations were a little more muted with the index at 100.0 in December, down 12 points from June.

With consumer spending accounting for roughly 70% of economic activity, consumer confidence is a key metric for gauging spending.

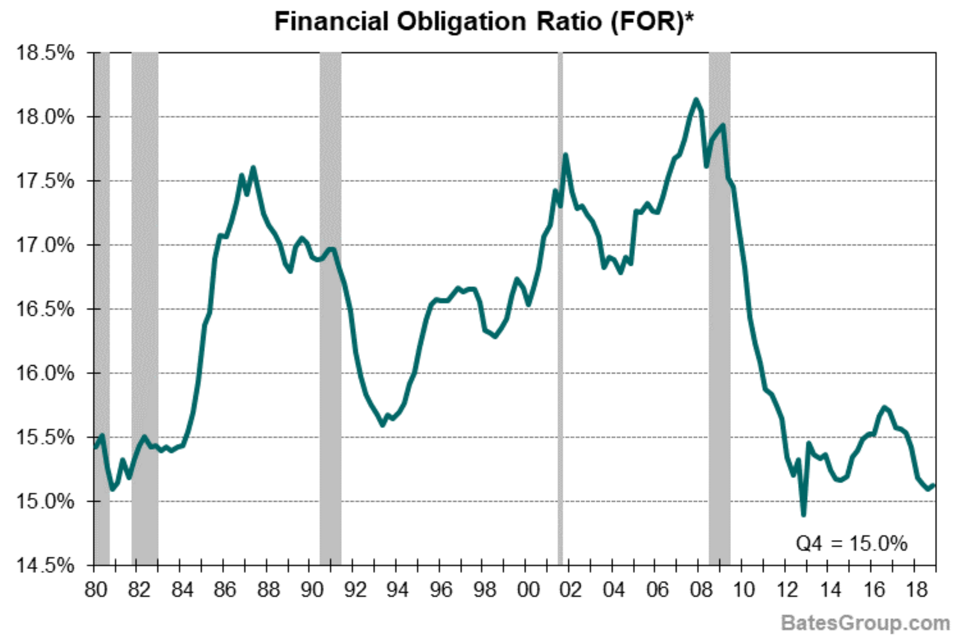


As the chart to the right highlights, consumer confidence tends to be a good barometer of retail spending levels.

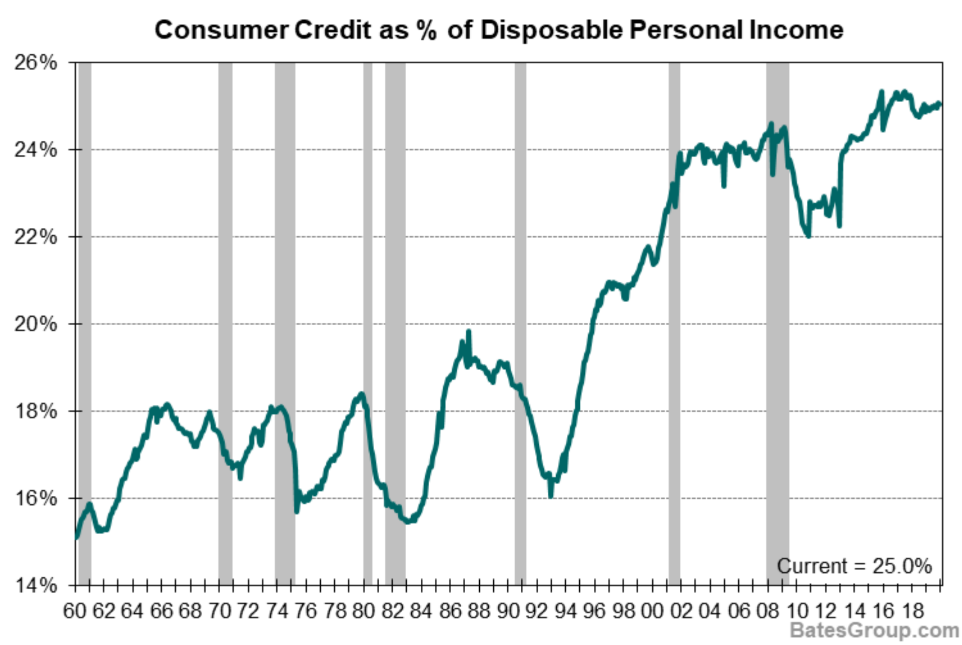


** Shaded areas represent recessions*
Source: The Conference Board, U.S. Census Bureau

The Federal Reserve's Financial Obligation Ratio (FOR) is an estimate of all debt payments plus car lease payments, rent, homeowner's insurance and property tax payments as a percentage of disposable personal income.



After significant household deleveraging during the credit crisis, consumers over the past few years have been increasing their debt levels to historically high levels.

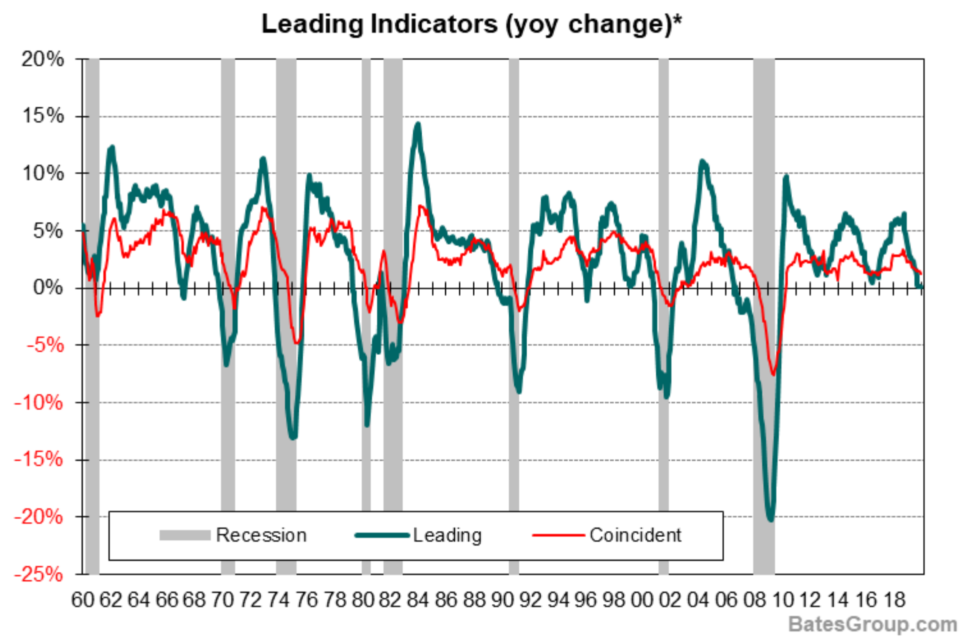


** Shaded areas represent recessions*
Source: Federal Reserve

Industry Indicators

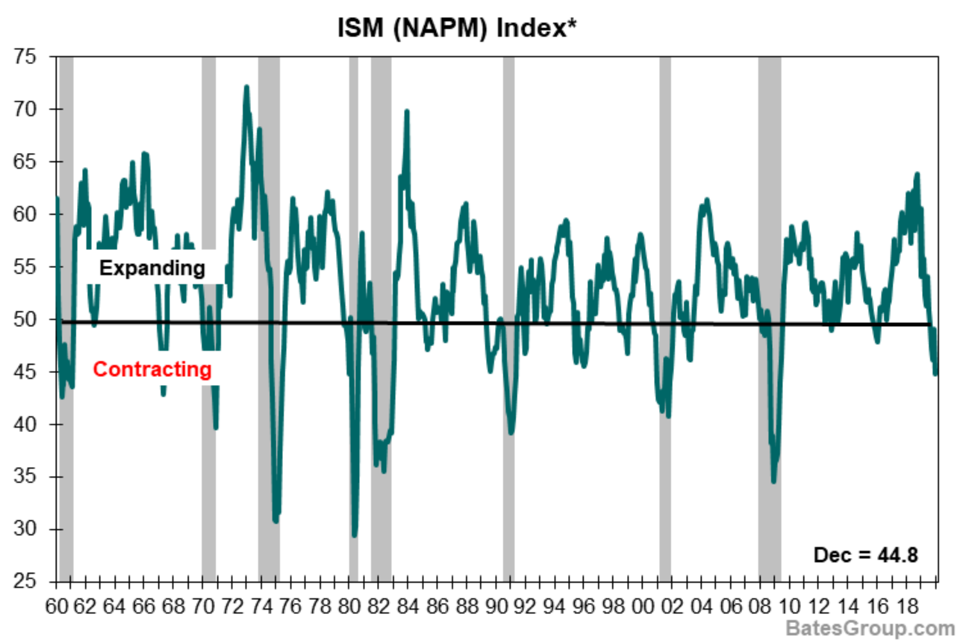
The index of leading indicators declined 0.3% in December to 111.7 in another sign that the U.S. economy had slowed. This marked a fourth month of declines for the index.

According to the Conference Board, "The LEI has now declined in four out of the last five months. Its six-month growth rate turned slightly more negative in the final quarter of 2019, with the manufacturing indicators pointing to continued weakness in the sector."



In the last month of the year, manufacturing activity contracted to the lowest level in 10 years. The Institute for Supply Management Index, a gauge on the health of the manufacturing sector, fell to 44.8. This marked the fifth straight month of contraction in the manufacturing sector.

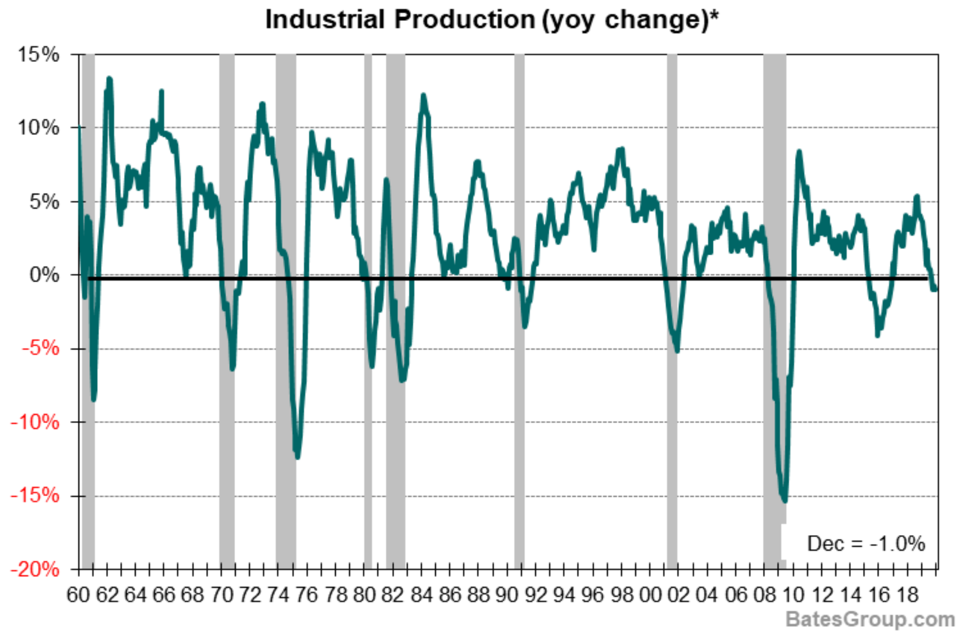
A reading below 50 represents a contraction in manufacturing activity.



** Shaded areas represent recessions*
Source: The Conference Board, Institute for Supply Management

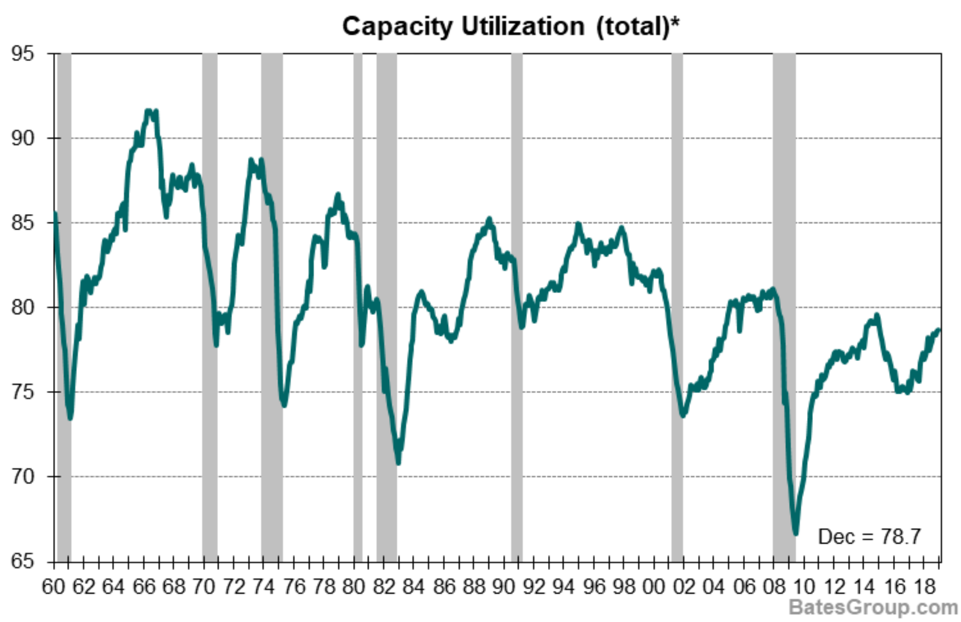
Industrial production declined 0.3% in December and was down at an annual rate of 1.0% for the year.

Manufacturing output was down 1.3% yoy and consumer goods output declined 1.6% year-over-year.



In December, the utilization rate was 77.0%, slightly below the long-term average of 79.8%.

Mining and crude were the only stages of processing that were operating above their long-run average, with the primary and semi-finished stages operating below their long-run averages.

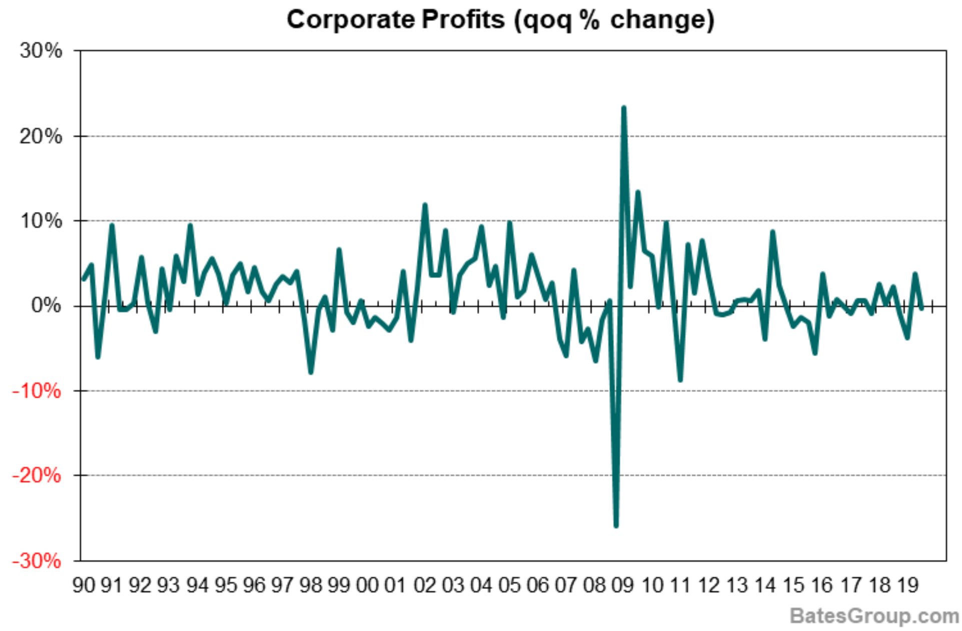


** Shaded areas represent recessions*
Source: Federal Reserve

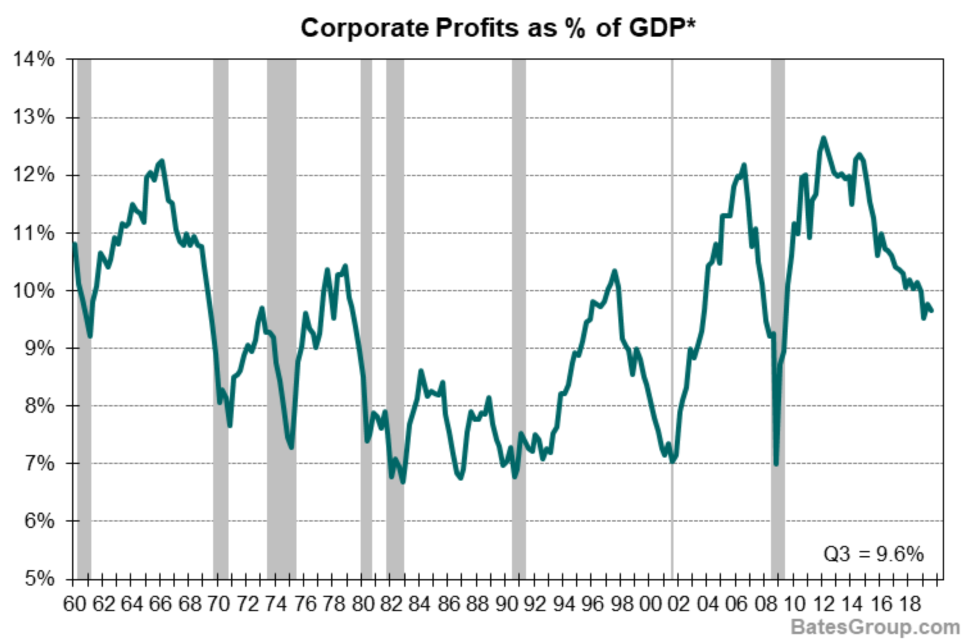
Corporate Profits

Corporate profits declined 0.2% in the third quarter of the year to $2,078 billion.

Profits for financial corporations declined by $4.7 billion while profits for nonfinancial companies fell $5.5 billion.



Corporate profit margins as measured by the ratio of corporate profits to GDP declined to 9.6% in the third quarter of 2019.



** Shaded areas represent recessions*
Source: Bureau of Economic Analysis

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