

Date	Indicator	For	Estimate	Consensus*	Previous Period
19-Nov-2018	NAHB Housing Market Index	Nov	67.0	67.0	68.0
20-Nov-2018	Housing Starts	Oct	1230k	1230k	1201k
20-Nov-2018	Building Permits	Oct	1260k	1260k	1270k
21-Nov-2018	Durable Goods Orders	Oct P	-3.0%	-2.1%	0.7%
21-Nov-2018	Durables Ex Transportation	Oct P	0.3%	0.4%	0.0%
21-Nov-2018	Initial Jobless Claims	17-Nov	218k	NA	216k
21-Nov-2018	Leading Index	Oct	0.0%	0.1%	0.5%
21-Nov-2018	Existing Home Sales	Oct	5.17m	5.20m	5.15m
21-Nov-2018	U. of Mich. Sentiment	Nov F	98.1	98.3	98.3
23-Nov-2018	Markit US Manufacturing PMI	Nov P	55.6	55.9	55.7
23-Nov-2018	Markit US Services PMI	Nov P	54.3	55.0	54.8
23-Nov-2018	Markit US Composite PMI	Nov P	NA	NA	54.9

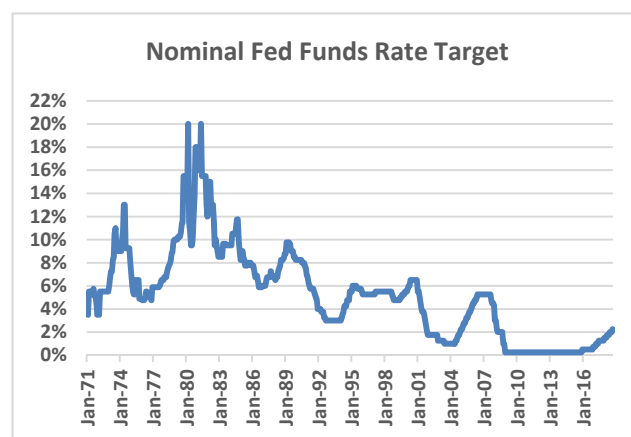
*Consensus from Bloomberg

Putting Fed Tightening Cycles Under the Microscope

Investors are working overtime to divine not only the Federal Reserve's next move, but how many more rate hikes we are likely to see in this cycle. If you believe the Fed's own median forecast, the FOMC plans to raise the fed funds target rate another five times between now and the end of 2020. If you look at the market's expectation and my own forecast, we are expecting only three more quarter-point rate hikes by the middle of 2019 and then a pause. This gap in fed funds interest rate expectations between the Fed and the market is well known and has been in place for some time.

What is less well-known or talked about is what happens next. How long will the pause in fed funds rate hikes be, and will the next move from the Fed be a rate cut? Jerome Powell says the FOMC is taking its cue from the economic and financial data and "needs to be thinking about how much further to raise interest rates and the pace at which we will raise rates." We thought now would be a good moment to review the history of past Fed tightening cycles and see if we can gain any insights about what happens next after the Fed completes its tightening cycle and decides to pause.

The Fed Funds Target Interest Rate



We count 10 distinct Fed tightening cycles since 1971. The one we are in the middle of right now would be number 11. You can see them listed in the table on the top of the next page. One thing you will notice right away is the Fed's record of achieving a soft landing for the economy at the end of an interest rate tightening cycle isn't all that good. Seventy percent of the time a recession ensued, from either six months before the fed funds rate stopped going up or as long as 18 months after. Of the 10 past tightening cycles, the median time before recession occurred from the last rate hike was 10 months, and the average was nine months.

Federal Reserve Tightening Cycles Since 1971

Tightening Cycle Dates	Number of Rate Hikes in Tightening Cycle	Basis Point Increase in Tightening Cycle	Length of Tightening Cycle (months)	Peak Nominal Rate in Tightening Cycle	Peak Real Rate in Tightening Cycle	How Long was The Pause in Policy (months)	Recession: Yes or No	How Long Before the Recession Began (months)	Change In Unemployment Rate (percentage points) *	10-Year/3-Month Spread (percentage points) **
Mar-71 to Aug-71	2	225	6	5.75%	1.39%	0	No	NA	-0.10	1.51
Mar-72 to Aug-73	8	750	18	11.00%	3.60%	0	Yes	3	4.20	-1.50
Mar-74 to May-74	3	400	3	13.00%	2.29%	1	Yes	-6	3.50	0.01
Aug-77 to Mar-80	17	1,412	32	20.00%	5.41%	0	Yes	16	2.40	-2.38
Aug-80 to May-81	5	1,050	10	20.00%	10.21%	0	Yes	2	3.30	-2.04
Mar-84 to Aug-84	3	225	6	11.75%	7.45%	1	No	NA	-0.10	1.82
Mar-88 to Feb-89	8	325	12	9.75%	5.10%	3	Yes	17	1.80	0.21
Feb-94 to Feb-95	7	300	13	6.00%	3.14%	4	No	NA	-0.10	1.25
Jun-99 to May-00	6	175	12	6.50%	3.37%	7	Yes	10	1.90	-0.09
Jun-04 to Jun-06	17	425	25	5.25%	1.07%	14	Yes	18	1.70	-0.22
Dec-15 to Present	8	200	35							
Median	6.5	363	12	10.38%	3.48%	1		10	1.85	-0.04
Average	7.6	529	14	10.90%	4.30%	3		9	1.85	-0.14
* 24 months after end of cycle tightening										
** spread is at the end of the tightening cycle										
10 Fed Tightening Cycle Since 1971										
							70% Recession			
							30% No Recession			

The other interesting and relevant tidbit about the past 10 tightening cycles was how long the Fed paused before reversing course and cutting rates again. Since nearly 3 out of 4 tightening cycles end in recession, it generally didn't take long for the Fed to recognize its mistake. In four tightening cycles there was no pause, the Fed raised rates for the last time only to started cutting again a month later. In fact, the median number months of pause was just one month, and the average was only three months before the Fed started cutting rates again.

My point is that it is actually very rare for the Fed to go on extended pause and hold rates at their peak level for more than a year. It did that only once after June 2006, when it held the fed funds target rate at 5.25% for 14 consecutive months. That ended of course with the Great Recession, and the Fed having to cut the fed funds rate to nearly zero for a decade.

In the tightening cycle we are in today, the Fed has already raised the fed funds target rate eight times, or 2.0 percentage points. Not that far off from some past tightening cycles. In the 1999 cycle the Fed raised rates only 1.75 percentage points, and in 1971 and 1984 it lifted

the fed funds rate only 2.25 percentage points. The median lift was 3.63 percentage points in all 10 cycles. In other words, the Fed is likely quite close to being done for this cycle, if history is any guide. Also the Treasury yield curve didn't have to invert for the Fed to stop hiking rates. The 10-Yr/3-Mo. spread only inverted in half of the past 10 tightening cycles.

Finally, the peak real interest rate, or the interest rate after subtracting out inflation, in each of the past 10 tightening cycles has been all over the map, from as high as 10% in 1981 to as low as 1.07% in June 2006. Given the low real rates we have all become accustomed to, I would bet the Fed will need to stop hiking at an even lower real rate this time around – below 3.0% in nominal terms. In short, reading the historical tea leaves from past Fed tightening cycles makes me even more comfortable with our fed funds rate forecast for this cycle. Three more quarter-point fed funds rate hikes by June 2019, with the peak rate at between 2.75 and 3.0%. And contrary to consensus market expectations and the Fed's own median forecast, we have the FOMC starting to cut interest rates again by March 2020 – a full nine months after the committee pauses.

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Major Economic Indicators

Economic Data	History								Forecast				Yr/Yr % chg or Annual Avg.			
	2017.1	2017.2	2017.3	2017.4	2018.1	2018.2	2018.3	2018.4	2019.1	2019.2	2019.3	2019.4	2016	2017	2018	2019
Real GDP*	1.8	3.0	2.8	2.3	2.2	4.2	3.5	2.4	2.2	2.1	1.9	1.8	1.5	2.2	2.9	2.5
Personal Consumption Expenditures*	1.8	2.9	2.2	3.9	0.5	3.8	4.0	2.4	2.3	2.3	2.1	1.9	2.7	2.5	2.7	2.6
Non-residential Fixed Investment*	9.6	7.3	3.4	4.8	11.5	8.7	0.8	5.7	3.9	4.1	3.7	3.4	-0.6	5.3	6.7	4.2
Private Housing Starts (000s units)	1,231	1,171	1,172	1,259	1,317	1,261	1,218	1,250	1,265	1,240	1,220	1,210	1,176	1,208	1,262	1,234
Vehicle Sales (mill. Units, annualized)	17.1	16.8	17.1	17.7	17.1	17.1	17.1	16.9	16.5	16.5	16.4	16.3	17.5	17.2	17.1	16.4
Industrial Production*	1.0	5.0	-1.5	7.7	2.5	5.3	3.3	2.6	2.2	2.0	1.7	1.5	-1.2	1.6	3.7	2.5
Nonfarm Payroll Employment (mil.)	145.9	146.3	146.9	147.4	148.1	148.7	149.3	149.9	150.4	150.9	151.3	151.7	144.3	146.6	149.0	151.1
Unemployment rate	4.7	4.3	4.3	4.1	4.1	3.9	3.8	3.7	3.6	3.6	3.7	3.8	4.9	4.4	3.9	3.7
Consumer Price Index* (percent)	3.0	0.1	2.1	3.3	3.5	1.7	2.0	3.0	2.5	2.0	2.1	2.1	1.3	2.1	2.5	2.3
"Core" CPI* (percent)	2.2	0.8	1.8	2.2	3.0	1.8	2.0	2.3	2.4	2.2	2.1	2.1	2.2	1.8	2.2	2.2
PPI (finished goods)* (percent)	5.7	1.0	1.6	5.7	3.6	2.9	2.0	4.1	1.9	1.8	1.7	1.7	-1.0	3.2	3.3	2.3
Trade Weighted Dollar (Fed BOG, major)	94.4	93.0	88.3	88.9	86.2	88.2	90.2	91.1	90.8	90.4	89.6	88.5	91.6	91.1	88.9	89.8
Crude Oil Prices -WTI (\$ per barrel)	52	48	48	55	63	68	70	63	59	58	57	57	43	51	66	58

*Quarterly Data Percent Change At Annual Rate; Annual Data Year-on-Year % Chg, or Annual Average.

Financial Data	History								Forecast				Annual Average			
	2017.1	2017.2	2017.3	2017.4	2018.1	2018.2	2018.3	2018.4	2019.1	2019.2	2019.3	2019.4	2016	2017	2018	2019
S & P 500	2,326	2,398	2,467	2,603	2,733	2,703	2,850						2,093	2,449		
Dow Jones Industrial Average	20,406	20,994	21,891	23,689	25,127	24,556	25,595						17,916	21,745		
Federal Funds Rate (effective)	0.70	0.94	1.15	1.20	1.45	1.74	1.92	2.21	2.46	2.71	2.88	2.88	0.39	1.00	1.83	2.73
Treasury-3 Month Bills (yield)	0.61	0.91	1.05	1.23	1.58	1.87	2.07	2.22	2.48	2.73	2.90	2.89	0.32	0.95	1.94	2.75
Treasury-2 Year Notes (yield)	1.24	1.30	1.36	1.69	2.16	2.48	2.67	2.90	2.96	3.06	3.07	3.06	0.84	1.40	2.55	3.04
Treasury-5 Year Notes (yield)	1.95	1.81	1.81	2.07	2.53	2.77	2.81	3.03	3.15	3.25	3.27	3.21	1.34	1.91	2.78	3.22
Treasury-10 Year Notes (yield)	2.45	2.26	2.24	2.37	2.76	2.92	2.92	3.15	3.29	3.42	3.48	3.41	1.84	2.33	2.94	3.40
Treasury-30 Year Notes (yield)	3.05	2.90	2.82	2.82	3.03	3.09	3.06	3.31	3.51	3.65	3.64	3.57	2.60	2.90	3.12	3.59
Prime Rate	3.80	4.05	4.25	4.29	4.53	4.80	5.01	5.25	5.50	5.75	6.00	6.00	3.51	4.10	4.90	5.81
Libor 3-Mo. U.S. Dollar	1.07	1.21	1.31	1.46	1.93	2.34	2.34	2.43	2.66	2.91	3.02	3.03	0.74	1.26	2.26	2.91
Mortgage-30 Year (yield)	4.17	3.98	3.88	3.92	4.28	4.54	4.57	4.80	4.97	5.08	5.13	5.05	3.66	3.99	4.55	5.06
BAA Corporate (yield)	4.66	4.49	4.33	4.27	4.47	4.78	4.81	5.08	5.40	5.60	5.80	6.10	4.71	4.44	4.78	5.73

Source: Bank of the West Economics, Bloomberg, Federal Reserve