

Dollars and Sense: Deconstructing the Yield Curve

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August 24, 2017

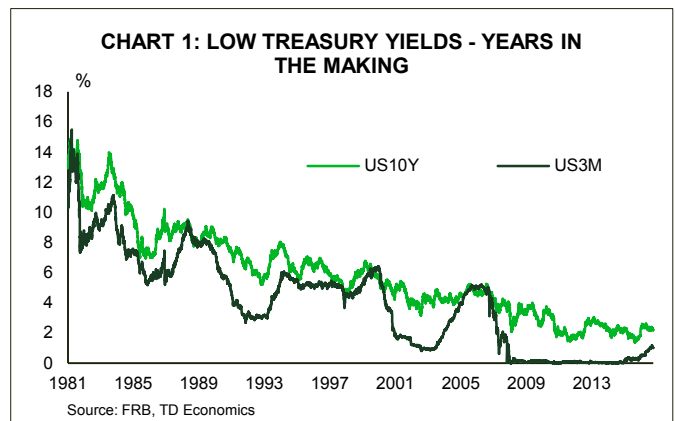
Highlights

- Treasury yields in the U.S. are low, probably too low. But are bonds in a bubble like some commentators are claiming? In our view, Treasury yields are simply trading on the low end of our fundamental range.
- A number of factors go into the fundamental value of bonds. Expectations for policy rates are materially lower based on weak productivity growth and current inflation dynamics. Absent any new developments on fiscal policy or otherwise, the Fed is not far off from where it needs to be on its policy rate.
- In addition, bond yields are weighed down by supply/demand forces that impact the term premium. Though the Fed will begin to reduce the size of its balance sheet and the ECB will likely announce reduced asset purchases in the near future, both their balance sheets will remain large and the global search for yield will persist.

Former Federal Reserve Chair, Alan Greenspan, recently made noise in the media with a controversial view that the bond market is in a bubble, which he evidenced by the persistence of “abnormally low” yields relative to the economic backdrop (Chart 1). So, our readers may be surprised to learn that we have lowered our U.S. yield forecasts across the curve. Our expectation is that inflation will take a little longer to reach the Federal Reserve’s target, necessitating a slightly slower pace for the policy rate and a lower term premium than previously thought. What accounts for the difference in views? We are not in complete disagreement with Greenspan, but feel the argument ignores current inflation dynamics and underestimates the influence of global factors on the term premium. These factors have, and will continue, to determine the amount that yields can advance over the next few years. In a nutshell, similar to Greenspan, we maintain the view that economic pressures will lift bond yields from today’s low levels, but we have a difference of opinion on magnitudes.

This isn’t your parents’ economy

Greenspan’s mention of stagflation and an interest rate bubble during a time of persistent low inflation and low corporate pricing power may be surprising to some. Yet, it’s not completely out of left-field and we would be remiss to look past the argument. By saying that bonds are in a bubble, the Maestro of the ‘American Boom’ is declaring that Treasury yields are significantly below their fundamental levels. This gap is so significant, that once the dam breaks on market sentiment, yields will rise with a force that will have an adverse impact on the economy. This is a bold warning, but one that would have difficulty manifesting over the near-term horizon.

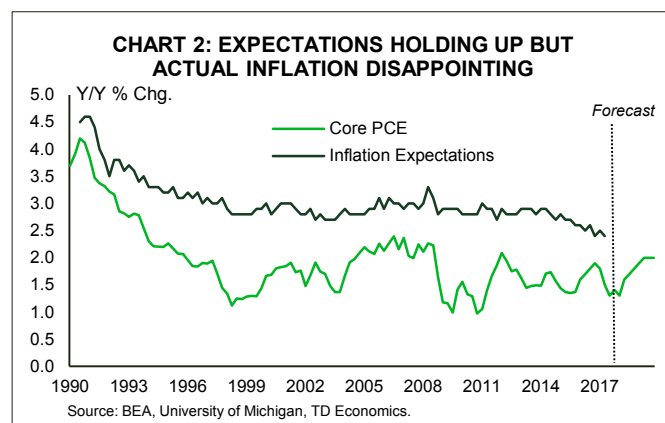


The Federal Reserve has raised rates in each of the last three quarters and confirmed that it will start to normalize its balance sheet. And yet, the 10-year Treasury yield is lower today than 9 months ago. Though some believe this reflects market mispricing on a systemic level, our models suggest that the current level of rates is merely resting on the low end of the fundamental range. This argues that rates should rise over the coming years, but towards a much lower ceiling than what has been observed historically.

Bottom-up yield fundamentals

The fundamental yield on the 10-year Treasury can be broken down into two basic components: expectations for short rates (the expectations hypothesis) and the term premium. The expectation for short rates is a geometric average of the expected path of the effective federal funds target over the next 10 years. This is why economists spend so much time dissecting Fed speeches. To help construct the most likely path for the fed funds rate, we use a variety of monetary policy rules (also known as Taylor Rules). These rules are guided by three major variables: inflation, economic slack, and the equilibrium rate that balances savings and investment (also known as R^*).

On the inflation side, actual data has been disappointing economists for years (Chart 2). We have written regularly on the changing [dynamics of inflation](#), noting why labor market and output tightness are not causing inflation to take off the way we have seen in the past. In spite of these inflation misses, long-term inflation expectations are still anchored around 2%. Even market based measures of expected inflation are holding up while current inflation disappoints. This implies that the Fed's target still maintains credibility, which provides a base for the path of rates. The stability of the Fed's target for inflation is also important as a comparison to actual inflation (and where it is expected to be over the next year). If it takes more time to push inflation to its target, the monetary policy rule will say that the Fed will have to adjust its course and slow the pace of interest rates hikes. Our current tracking shows that the Fed's preferred metric for inflation,



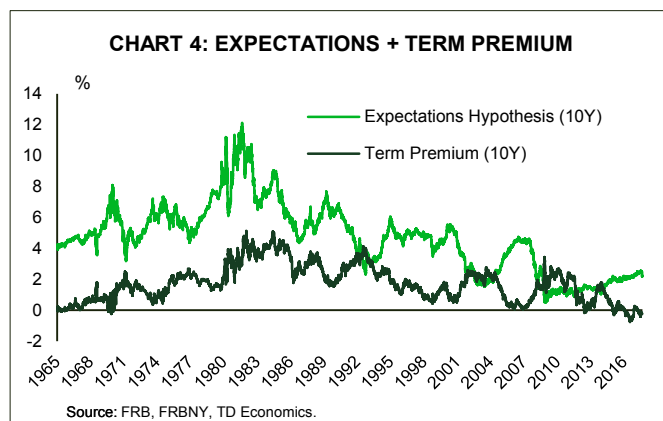
core PCE, will remain below target through 2018. This is slightly more delayed than we previously anticipated. Nevertheless, it argues for a slower policy path from the Fed.

Clearly one development that can cause a swift repricing of bonds is an unexpected rise in inflation. To gauge this risk within the monetary policy framework, we use measures of labor market and output slack. With one of the two mandates of the Fed being full employment, the difference between the unemployment rate and the natural rate of unemployment has typically been a useful metric. Some estimates suggest the unemployment rate has already pushed below its natural rate. The Greenspan argument might view wage and inflation pressures as a wolf in sheep's clothing, waiting to bite. We have long been of the view that wage pressures will continue to build within the U.S., but an abrupt or unwieldy adjustment is unlikely within a market that still has the means to temper pressures. The abnormally low participation rate has room to go before it is normalized (Chart 3). The same goes for output slack, as capacity pressures are not hitting critical thresholds that would cause marginal costs to climb as they would if corporations were hitting constraints. The existence of shadow labor and output slack reiterate the need for a gradual path for the policy rate, and so these influences should not be the source of a sharp or sudden rise in bond yields.

Finally, the monetary policy rule is completed with the addition of the natural rate of interest (R^*). This is the rate that balances savings and investment.

With steady declines in the estimates of potential growth, less productivity enhancing innovation, and a large deleveraging cycle post-crisis, investment and estimates of R^* have been steadily cut over the years. As it stands, R^* is close to zero (of which Fed Chair Yellen agrees), which is about 1 percentage point below what is being telegraphed by the Fed dot plot. The time-variant R^* may rise going forward and we do see evidence that we are hitting a trough in investment spending and productivity in America. But, this argues for higher yields, not necessarily high yields. We would alter our estimate of R^* and our forecast for the Fed policy path, should some factor convince us to lift potential GDP growth. As an example, this could stem from a higher level of investment in the event of lower and more efficient corporate taxes. But, on the flip side, the opposite would be true if immigration policy hinders labor force growth.

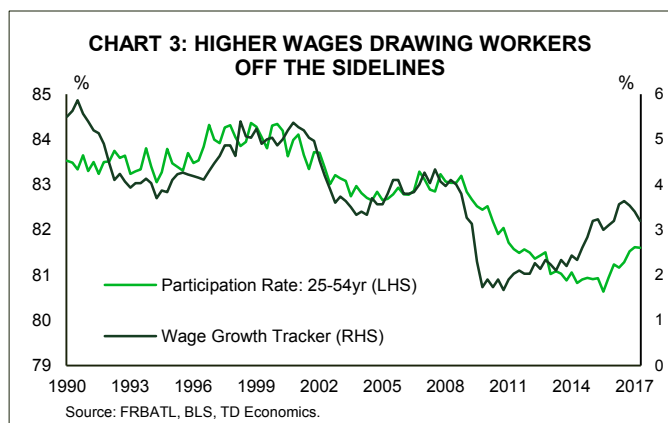
Combining forecasts of R^* , inflation, and slack gets us our monetary policy rule. If we assume R^* balances around 0-25 bps, inflation stabilizes at 1.8 to 2.0%, and economic slack diminishes in the next year or two, that gives a policy rate range of 1.75 to 2.25%. With the effective fed funds rate at 1.15%, there is room for the Fed to keep hiking. But, if the Fed raises rates too far beyond that range, it risks stunting economic growth. For this reason, we believe the FOMC will start to express caution in its future interest rate decisions and not be so quick to look past current weak inflation data. This thought framework underpins our view of a U.S. 10-year Treasury yield within a fair value of 2.0 to 2.5%, based solely on the expectations hypothesis.



Term premium carries uncertainty

At the risk of sounding like an infomercial, “but wait, we’re not done yet”. We have to throw in the term premium! The purchaser of a 10-year bond is committing to receive a locked-in stream of income for the next decade (determined by the prevailing yield on that bond assuming it is held to maturity). So in addition to the expectations hypothesis (determined by the Fed path), a buyer of a long duration bond typically demands a premium for this commitment. According to estimates by the Federal Reserve Bank of New York, the premium on the 10-year Treasury has averaged +1.75% over the last 50 years. But, over the past twelve months, it has averaged -0.12%.

There are a number of factors at play in determining the term premium, including the risk that interest rates will rise more than expected, often associated with the need to curb higher inflation. But, interest rate risk has been falling in parallel with greater central bank credibility, transparency, and control over inflation since the 1980s. This reduction of perceived interest rate risk (along with a falling R^*) aided the 35-year bull run for Treasuries (Chart 4). For the term premium to rise, there needs to be corresponding confirmation that inflation is destined to push higher. We believe this will be the case. But, for the term premium to return to past levels, we would need confirmation that broad-based inflation is going to overshoot the central bank’s 2% target by a good full-point or more, which seems like a low probability outcome.



Another factor that could pressure the term premium up sharply stems from the dynamics underpinning bond supply and demand. Here too we believe the balance of risks is tilted to higher market supply and higher term premiums, but not a wild swing. That said, of all the components that offer the greatest degree of uncertainty, this one is at the top of our list.

On the demand side, the [normalization of the Fed's balance sheet](#) means that the Federal Reserve will purchase fewer and fewer Treasuries. The intention of Quantitative Easing (QE) in the U.S. was to create demand for Treasuries and lower the long-end of the yield curve. We estimate that the downward impact on the U.S. 10-year yield was 30-50 bps, and much of this will reverse going forward. Again, this is an argument for higher yields, but not necessarily high yields. As the Fed steps away from reinvestment of maturities, the term premium should push higher as a critical source of demand dissipates. But, the Fed has signaled a slow and incomplete withdrawal from the market. This means that it will hold more Treasuries than previous thought – somewhere in the range of \$500 bn to \$1 tn. In addition, other central banks (ECB and BoJ) are still in the QE-game, intensifying demand pressures for their domestic sovereign debt. This keeps investors in search of yield, which the U.S. Treasury market offers. The degree to which Federal Reserve demand is substituted by that of the private sector creates push and pull factors on yields.

The term premium should rise

The term premium is probably lower than it should be, and if there is a bond bubble, as Greenspan postulates, this is where it would more likely reside. Following the U.S. election results, we saw a very quick

adjustment in bond yields with the term premium jumping 60 basis points in a month. This reflected a reset of market expectations under speculation that the new administration would embark on aggressive tax reform, with potentially large long-term implications for budget deficits and economic growth. Neither materialized and the term premium completely unwound its post-election move once reality set in. However, we do now have a benchmark for what may be on the horizon, should any of those developments change in the coming months.

We remain on the lookout for potential game changers that can take many forms, including bank deregulation that reduces demand for Treasuries, or the passage of fiscal policy or corporate tax reform. As it stands, we are not there yet.

Guiding our world view

Though the rhetoric out of the FOMC remains hawkish with participants looking past current weak inflation readings, persistence in soft inflation will eventually impact the path of the Fed. Based on our forecast for core PCE, we are anticipating that the data dependency of the Fed will cause it to maintain a cautious path. For the same reason, we believe that the Treasury yield curve will remain flat. In addition to low interest rate/inflation risk, slower than expected balance sheet normalization, and still less Treasury issuance risk will limit the increase in the term premium. Due to global financial linkages, this yield curve profile will be echoed in other sovereign curves. In the end, yields should rise, but their ascent will be constrained. It is important to view the economic reality for what it is. Historical and theoretical frameworks form the crux of our world view, with recognition that the dynamics for inflation and term premiums present some crosswinds.

INTEREST RATE & FOREIGN EXCHANGE RATE OUTLOOK

		Spot Rate	2016				2017				2018			
		Sep-08	Q1	Q2	Q3	Q4	Q1	Q2	Q3F	Q4F	Q1F	Q2F	Q3F	Q4F
Interest Rates														
Fed Funds Target Rate		1.25	0.50	0.50	0.50	0.75	1.00	1.25	1.25	1.50	1.50	1.75	1.75	2.00
3-mth T-Bill Rate		1.03	0.21	0.26	0.29	0.51	0.76	1.03	1.27	1.40	1.53	1.65	1.78	1.90
2-yr Govt. Bond Yield		1.27	0.73	0.58	0.77	1.20	1.27	1.38	1.30	1.70	1.85	1.95	2.10	2.25
5-yr Govt. Bond Yield		1.64	1.21	1.01	1.14	1.93	1.93	1.89	1.70	2.20	2.35	2.45	2.55	2.65
10-yr Govt. Bond Yield		2.06	1.78	1.49	1.60	2.45	2.40	2.31	2.20	2.60	2.70	2.80	2.90	2.95
30-yr Govt. Bond Yield		2.68	2.61	2.30	2.32	3.06	3.02	2.84	2.70	3.10	3.20	3.30	3.30	3.30
10-yr-2-yr Govt Spread		0.79	1.05	0.91	0.83	1.25	1.13	0.93	0.90	0.90	0.85	0.85	0.80	0.70
Exchange rate to U.S. dollar														
Chinese Yuan	CNY per USD	6.49	6.45	6.65	6.67	6.94	6.88	6.78	6.85	7.00	7.00	7.00	7.00	7.00
Japanese yen	JPY per USD	108	112	103	101	117	111	112	110	112	110	108	105	105
Euro	USD per EUR	1.20	1.14	1.10	1.12	1.06	1.07	1.14	1.18	1.16	1.18	1.18	1.20	1.20
U.K. pound	USD per GBP	1.32	1.44	1.32	1.30	1.23	1.25	1.30	1.28	1.30	1.30	1.33	1.36	1.38
Swiss franc	CHF per USD	0.95	0.96	0.98	0.97	1.02	1.00	0.96	0.97	0.97	0.96	0.96	0.96	0.96
Canadian dollar	CAD per USD	1.21	1.30	1.30	1.31	1.34	1.33	1.30	1.22	1.20	1.19	1.20	1.21	1.22
Australian dollar	USD per AUD	0.81	0.77	0.74	0.77	0.72	0.76	0.77	0.78	0.77	0.78	0.78	0.79	0.79
NZ dollar	USD per NZD	0.73	0.69	0.71	0.73	0.70	0.70	0.73	0.72	0.73	0.74	0.75	0.75	0.75
Exchange rate to Euro														
U.S. dollar	USD per EUR	1.20	1.14	1.10	1.12	1.06	1.07	1.14	1.18	1.16	1.18	1.18	1.20	1.20
Japanese yen	JPY per EUR	130	128	113	114	123	119	128	130	130	130	127	126	126
U.K. pound	GBP per EUR	0.91	0.79	0.83	0.86	0.86	0.85	0.88	0.92	0.89	0.91	0.89	0.88	0.87
Swiss franc	CHF per EUR	1.14	1.09	1.08	1.09	1.07	1.07	1.09	1.15	1.13	1.13	1.13	1.15	1.15
Canadian dollar	CAD per EUR	1.46	1.48	1.44	1.47	1.42	1.43	1.48	1.44	1.39	1.40	1.42	1.45	1.46
Australian dollar	AUD per EUR	1.49	1.48	1.48	1.47	1.46	1.40	1.49	1.51	1.51	1.52	1.51	1.53	1.52
NZ dollar	NZD per EUR	1.66	1.65	1.55	1.54	1.52	1.53	1.56	1.64	1.59	1.60	1.57	1.60	1.60
Exchange rate to Japanese yen														
U.S. dollar	JPY per USD	108	112	103	101	117	111	112	110	112	110	108	105	105
Euro	JPY per EUR	130	128	113	114	123	119	128	130	130	130	127	126	126
U.K. pound	JPY per GBP	142	162	136	132	144	140	146	141	146	143	144	143	145
Swiss franc	JPY per CHF	114.0	117.3	105.0	104.4	114.9	111.4	117.3	113.4	115.5	114.6	112.5	109.4	109.4
Canadian dollar	JPY per CAD	88.8	86.7	79.0	77.2	87.0	83.6	86.6	90.2	93.3	92.4	90.0	86.8	86.1
Australian dollar	JPY per AUD	86.9	86.3	76.4	77.6	84.4	85.1	86.3	85.8	86.2	85.3	84.2	82.4	83.0
NZ dollar	JPY per NZD	78.3	77.9	73.2	73.8	81.3	78.0	82.3	79.2	81.8	81.4	81.0	78.8	78.8

F: Forecast by TD Economics, September 2017; Forecasts are end-of-period;
Source: Federal Reserve, Bloomberg.

GLOBAL STOCK MARKETS

	Price Aug-23	30-Day % Chg.	YTD % Chg.	52-Week High	52-Week Low
S&P 500	2,446	-1.1	9.3	2,481	2,085
DAX	12,174	-0.5	6.0	12,889	10,259
FTSE 100	7,383	-0.9	3.4	7,548	6,666
Nikkei	19,435	-3.3	1.7	20,230	16,252
MSCI AC World Index*	474	-0.5	12.5	480	403

*Weighted equity index including both developing and emerging markets.
Source: Bloomberg, TD Economics.

COMMODITY PRICE OUTLOOK

	Price Aug-23	52-Week High	52-Week Low	2016				2017				2018			
				Q1	Q2	Q3	Q4	Q1	Q2	Q3F	Q4F	Q1F	Q2F	Q3F	Q4F
Crude Oil (WTI, \$US/bbl)	48	54	42	33	45	45	49	52	48	48	50	51	52	54	55
Natural Gas (\$US/MMBtu)	2.92	3.76	2.03	1.97	2.13	2.85	3.02	2.99	3.04	3.05	3.10	3.15	3.20	3.25	3.30
Gold (\$US/troy oz.)	1290	1350	1128	1182	1259	1335	1216	1218	1258	1275	1275	1300	1300	1325	1325
Silver (US\$/troy oz.)	17.1	20.1	15.6	14.9	16.8	19.6	17.1	17.5	17.2	17.8	17.8	18.5	18.5	19.3	19.3
Copper (cents/lb)	297	297	208	212	215	216	240	264	257	257	258	260	260	265	265
Nickel (US\$/lb)	5.18	5.28	3.99	3.86	4.00	4.65	4.90	4.66	4.19	4.20	4.25	4.50	4.75	5.00	5.00
Aluminum (Cents/lb)	94	95	71	69	71	73	78	84	87	84	84	86	86	84	84
Wheat (\$US/bu)	7.53	7.53	5.41	5.89	6.06	5.73	6.48	6.53	6.80	8.00	8.50	8.50	8.75	8.75	9.00

F: Forecast by TD Economics, August 2017; Forecasts are period averages; E: Estimate.
Source: Bloomberg, USDA (Haver).



INTERNATIONAL INTEREST RATE OUTLOOK													
	Spot Rate Aug-23	2016				2017				2018			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3F	Q4F	Q1F	Q2F	Q3F	Q4F
Germany													
ECB Deposit Rate	-0.40	-0.40	-0.40	-0.40	-0.40	-0.40	-0.40	-0.40	-0.40	-0.40	-0.40	-0.40	-0.40
3-mth T-Bill Rate	-0.67	-0.59	-0.68	-0.80	-0.99	-0.94	-0.82	-0.75	-0.70	-0.60	-0.50	-0.40	-0.30
2-yr Govt. Bond Yield	-0.73	-0.52	-0.66	-0.68	-0.88	-0.74	-0.57	-0.60	-0.45	-0.40	-0.25	-0.15	0.10
5-yr Govt. Bond Yield	-0.31	-0.33	-0.57	-0.58	-0.54	-0.37	-0.22	-0.15	-0.10	0.00	0.10	0.20	0.30
10-yr Govt. Bond Yield	0.38	0.15	-0.13	-0.12	0.20	0.33	0.47	0.50	0.60	0.70	0.80	0.90	1.00
30-yr Govt. Bond Yield	1.13	0.84	0.83	0.78	0.94	1.11	1.25	1.30	1.40	1.50	1.50	1.50	1.50
10-yr-2-yr Govt Spread	1.11	0.67	0.53	0.56	1.08	1.07	1.04	1.10	1.05	1.10	1.05	1.05	0.90
United Kingdom													
Bank Rate	0.25	0.50	0.50	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
3-mth T-Bill Rate	0.21	0.59	0.51	0.28	0.32	0.17	0.10	0.25	0.25	0.25	0.25	0.25	0.25
2-yr Govt. Bond Yield	0.20	0.44	0.10	0.10	0.05	0.12	0.34	0.35	0.40	0.45	0.50	0.65	0.70
5-yr Govt. Bond Yield	0.47	0.84	0.35	0.22	0.47	0.56	0.69	0.80	0.85	0.90	1.00	1.05	1.15
10-yr Govt. Bond Yield	1.06	1.42	0.87	0.75	1.45	1.14	1.26	1.50	1.55	1.75	1.90	2.00	2.10
30-yr Govt. Bond Yield	1.72	2.29	1.70	1.49	1.87	1.72	1.87	2.10	2.15	2.35	2.45	2.50	2.55
10-yr-2-yr Govt Spread	0.86	0.98	0.77	0.65	1.40	1.02	0.91	1.15	1.15	1.30	1.40	1.35	1.40

F: Forecasts by TD Bank Group, August 2017; Forecasts are end-of-period;
Source: Bloomberg.

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