US Equity Strategy

Implication of Yield Curve Inversion for Equities

This report analyzes yield curve inversion as a signal for equities and the broader cycle. We present several arguments as to why the current inversion signal is not robust and does not imply the end of the equity cycle. Instead, falling rates should provide more room for the equity multiple to re-rate from here. The 10-year bond yield fell below 3-month T-bill yield last Friday for the first time since 2006. This trails inversion in the near-term forward spread (2Y forward-3m), often considered a better predictor of the Fed's future policy, turning negative early Jan. The other commonly tracked spread, 10Y-2Y, remains positive and has even steepened some since Friday. In fact, the US yield curve on the whole remains still relatively steep compared to past inversions (Figure 12 and Figure 13). The diffusion index of inversions (all term spreads along the yield curve) is solidly below levels seen prior to previous recessions (Figure 14). Abroad, Germany's yield curve, which like the US historically inverts before a recession, is positive with 10Y-3M spread at 45bps. The yield spread in China, an economy of increasing importance for global growth, is above 90bps. QE-driven negative yields in Japan (with positive curve slope as well) and Germany are also likely exerting downward pressure and anchoring US long-term rates. Nonetheless, market nervousness in the face of US 10Y-3M inversion is understandable.

Since 1960s, 7 out of the 8 US yield curve inversions (Figure 16) were followed by a recession. **The most common explanation of the inversion-to-recession regularity is that a negative yield curve implies investors expect future short-term rates to be lower as monetary policy eases in response to an impending recession.** This reasoning has two parts. One, a decline in the current 10-year yield is largely driven by market expectations of lower future short-term rates. Two, lower short-term rates, i.e. future policy easing, necessarily signal an impending recession. **While acknowledging the inversion-to-recession regularity, we believe that the many unusual characteristics of the current cycle and the global macro backdrop require careful assessment** of both legs of the inversion-to-recession argument. In this decade old expansion with intra-cycle acceleration and deceleration in growth and tightening labor market, inflation has remained stubbornly low. The market and policy makers face a familiar conundrum — what is the appropriate neutral policy rate (r*) which balances inflation and growth objectives? The recalibration of policy expectations following repricing of risk triggered by 4Q18 market sell-off and dovish signals by the Fed post-Dec FOMC meeting suggests that prior rates path (Dot plot) was likely too high and inconsistent with optimal inflation and growth objectives. It does not necessarily imply that the cycle is inexorably heading into a recession. Even the pessimists should note that the lag between inversion and subsequent recession has increased, nearly doubling (~17-months) for the latest three 10Y-2Y inversions compared to the prior four (9-months). In the 2008 recession, the lag was 22-months, and it could be even longer in this cycle given continued unconventional monetary policies (Figure 15).

Falling 10-year bond yield and inversion of the 10Y-3M spread may primarily be driven by lower term premia, renewed deflationary pressures, re-pricing of global QE, all of which should not be viewed as a negative for equities but instead provide room for the multiple to re-rate higher. Ironically, just 6 months ago, with 10-year yields above 3%, investors were worried that rising rates would cap or even pressure multiples lower. Above trend revenue growth of ~5% and lower rates argues for higher equity valuations (S&P 500 is currently trading near the long-term average of ~16.5x). History suggests that there is a negative correlation between rates and

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Figure 1: Yield Curve Steeper than Prior Inversions

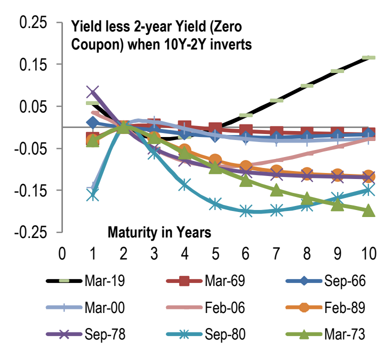

Figure 2: Fed Tightening Usually Continues after 10Y-3M Inversion, Unlikely This Time

	Change in Fed Target rate Post Day of Inversion			
Inversion	1M	3M	6M	12M
1/12/1966	0.13	0.25	1.00	0.50
12/17/1968	-0.38	1.00	0.12	3.62
6/1/1973	1.00	2.25	0.75	4.75
11/1/1978	0.13	0.25	0.25	3.25
10/27/1980	1.25	2.25	2.25	1.75
3/28/1989	0.00	-0.12	-0.75	-1.50
4/5/2000	0.00	0.50	0.50	-1.00
1/18/2006	0.25	0.50	1.00	1.00
Median	**0.13**	**0.50**	**0.63**	**1.38**

Source: J.P. Morgan US Equity Strategy

See page 12 for analyst certification and important disclosures.

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equity multiples/performance contemporaneously and over the next 12 months. In fact, a 100bps decline in rates resulted in S&P500 gaining ~10% with some multiple re-rating over the next one year (Figure 21).

Driving 10-year bond yield lower are the following factors. (1) The 10-year yield curve can be decomposed into estimated (unobservable) term premia and average future (risk neutral) short-term rates. In this cycle **the term premia** (excess yield required to hold a long-term bond instead of a series of shorter-term bonds) **is at record low levels and is currently negative** (-78bps on Mar 22, NY Fed estimate). Depressed term premia more than expectations of very low future short-term rates has driven the 10-year yield lower recently (Figure 17 to Figure 20). The term premium has been largely driven by implied rate volatility, the volatility of medium-term inflation expectations, global FX reserves, and changes in these factors. All of these are unlikely to change soon (see FI strategy note). **(2) Unconventional global monetary policies**, including purchase of government securities, are also artificially suppressing the bond yields. US Fed balance sheet has dropped from a peak 25% of GDP to 19% but G4 balance sheet has dipped only marginally from 37% of GDP to 36% due to continued easing (Figure 23 to Figure 25). JPM estimates that every $1 trillion in DM (Fed, ECB, BoJ, BoE) QE reduced 10-year yields by 15-20bp. With inflation still subdued in Japan and Eurozone, BOJ and ECB are likely to remain dovish. The Fed's decision to leave $1tn of reserves in the banking system, up from $500bn previously (here), has likely kept yields lower than otherwise. Along the same vein, recent JPM FI analysis indicates that each 1%-pt. increase in the Fed's balance sheet as a share of GDP flattens the 2s/10s curve by approximately 3.9bp. Thus, the curve is approximately 40bp flatter than it would be with a smaller Fed balance sheet. Free Liquidity, the ratio of M2 to GDP, has tapered off in the US but continues to rise in Japan and Eurozone (Figure 26). **(3) Stronger US growth relative to major developed economies along with relatively higher US nominal and real yields** are paradoxically putting downward pressure on US yields. US 10-year bond yield is currently 1.4% and 1.2% higher than the average nominal and real yields of its global peers. By contrast, in past eight inversions of the yield curve, US yield was -0.8% and -1.5% *below* the average of its peers (Table 1). **(4)** The steep decline in 10-year yield coincides with **flipping late-2018 / early-2019 of momentum signals often used by CTAs** (Figure 27). Thus, the market may have initially reacted to an essentially technical move in the yield curve rather than a fundamental signal. **(5) The supply of treasury bills as a share of total marketable treasury securities** has been edging up for the past three years from a 60-year low in 2016 (Figure 32). On the margin, this would tend to flatten the yield curve (higher T-bill yield relative to T-notes/bonds yield). Similarly, demand for Treasury securities from rest of the world remains high and underpins lower yields. JPM estimates that each 1% increase in foreign holdings lowers 10-year yield by 7bps. While foreign demand should remain relatively muted compared to the earlier part of the decade, large-scale selling is unlikely (Figure 33). **(6)** Lastly, **the 2011 repeal of Reg-Q** and greater stickiness of bank deposits may have structurally raised the short end of the yield curve and narrowed the term spread for a reason unrelated to recessions.

We think that the links between expectations of policy easing and recession are more tenuous now than in past 10Y-3M yield inversions. The economy is currently not overheating. Real activity and inflation backdrop were much stronger in the previous yield inversions compared to now (Table 2 and Table 3 and Figure 22). The real Fed Funds rate is also very low compared to the past (0.3 vs. 1.3, the average during past inversions). **Expectations of policy easing embedded in yield inversion likely signal policy action to stabilize low inflation or prevent deflation rather than to cushion an impending recession.** The spread between current Fed Funds rate and the risk neutral average 5-year short-term rate implied by 5-year bond yield now stands far above levels associated with a recession, Figure 20. This cycle has many unique features. Usually in the tenth year of a cycle, wage and price inflation are unambiguously visible, possibly accelerating especially if unemployment rate is near

Figure 3: Breadth of YC Inversion Narrow

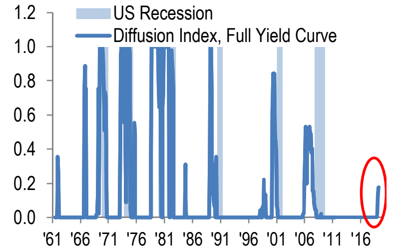


Figure 4: P/E Multiple Expands When Yield Drops

			Performance		Δ in PE		
	1yr Δ in 10yr Bond Yield	Count	Last 12M	Next 12M	Last 12M	Next 12M	
Lower	-500 to -400bps	4	24%	22%	3.5x	3.8x	Higher
Rates	-400 to -300bps	11	31%	14%	4.2x	1.7x	Multiples
	-300 to -200bps	18	24%	19%	2.9x	2.4x	
	-200 to -100bps	78	8%	8%	0.3x	0.3x	
	-100 to 0bps	256	6%	10%	0.3x	0.5x	
	Rates ↑ (all periods)	367	9%	10%	0.6x	0.6x	
	Rates ↓ (all periods)	463	9%	8%	(0.2x)	(0.2x)	
	0 to 100bps	363	10%	8%	(0.1x)	(0.0x)	
	100 to 200bps	76	8%	7%	(0.3x)	(1.1x)	
	200 to 300bps	15	8%	14%	(2.1x)	0.2x	
Higher	300 to 400bps	8	6%	3%	(0.1x)	(0.0x)	Lower
Rates	400 to 500bps	1	8%	(15%)	1.0x	(1.5x)	Multiples

Figure 5: Term Premia Lowest Since Early 1960s

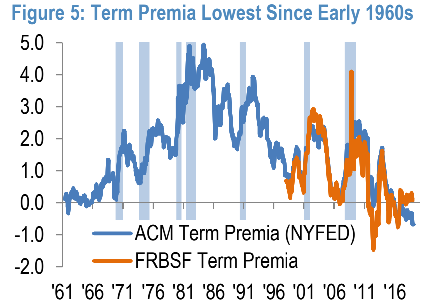
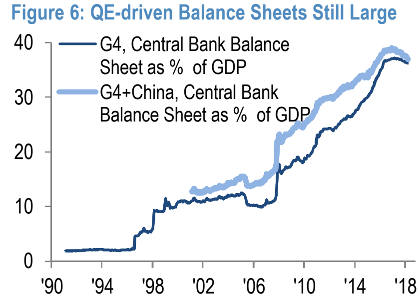


Figure 6: QE-driven Balance Sheets Still Large



Source: J.P. Morgan Quantitative and Derivatives Strategy

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record low level. Labor participation should have also been much higher by this point in a typical cycle. In addition, technological disruptions have likely turned inflation-growth dynamics on its head (e.g. the Phillip curve that relates inflation and growth/employment is a lot flatter now). If anything, in this cycle growth drivers can often be deflationary (think e.g. Tech, AMZN, UBER, NFLX, oil fracking, tax cuts) while stimulating growth at the same time. **Historically the Fed has hiked rates, on average** (by 13bps, 50bps, 63bps and 138 bps after 1, 3, 6 and 12 months) **post the first inversion day in 10Y-3M** (Figure 29). In this cycle, the Fed is expected to remain on hold or even cut rates over the next 12 months. **Extrapolating implications of past yield curve inversions can be misleading in the current backdrop.**

More so, the current inversion is happening at a time when financial markets have largely priced in a slowdown and have already re-priced risk – defensives have done better and are expensive, cyclicals less so and have become cheaper in the last one year (Table 4). Similarly, the Low Vol-to-Value style spread has already blown out to new highs (see here). **A 20% market sell-off already preceded this 10yr-3m curve inversion, flushing out a significant dose of leverage and excess positioning.** The net long/short equity exposure based on our JPM prime book is at 16th percentile over the last 3 years (Figure 30). Equity flows have also been negative for the past year and are just reversing (Figure 31). Positioning data has been aggregated by the Prime Finance business to ensure client anonymity and confidentiality. No raw data has been made available to Research. **With the Fed on hold, lower long-term rates are likely to spur a rally in cyclicals and riskier stocks in absence of a recession.**

- **Key differences between the asset performance backdrop of current and past inversions**: (a) Bond market has rallied more (though there may be other special reasons accentuating the performance, 9% vs. 0%, the average during past inversions); (b) The dollar is stronger (up 4% vs. 0%); (c) S&P 500 has not appreciated as much going into this inversion (3% vs. 6%); (d) Equity market is a lot cheaper (Earnings Yield minus Bond Yield) is highest with the exception of 1978 (2.70 vs. -0.36); (e) Gold, often seen as a hedge to inflation, is weaker (-1% vs. +37%); (f) Small caps have underperformed Large caps on 12-month basis (-1% vs. +11%); (g) Dow Transportations underperformed Dow Utilities (-13% vs. +9%); (h) Credit Spread (BAA-AAA) is wider than average (1.2 vs. 0.8).

Foreign yield curves—of eight liquid developed bond markets, only the US and Germany have an almost causal relationship between 10Y-3M yield curve and recessions historically (Figure 34 and Figure 35). In the UK and Canada recessions are usually preceded by yield curve inversion. However, these two countries had no recession in 2000 even though the yield curve inverted (Figure 37and Figure 38). Australia has not had a recession since 1990 and yet its yield curve has inverted 3 times in sympathy with the US in that period (Figure 39). Since 1992, recessions in France and Italy have occurred without yield curve inversion (Figure 40 and Figure 41). This is probably due to an additional country premia over Germany in their long bonds. Japan is the most peculiar case where the 10Y-3M spread has not been negative since at least 1960s (Figure 36). The 10Y-2Y spread inverted in 1989 (history is short), 17 months prior to the 1991 recession but the curve did not invert in the next 4 recessions (1997, 2000, 2008 and 2012). Even though yield curve may not invert, its slope (flattening and steepening) may help forecast recessions. Using a single variable (yield curve) probit model to forecast recessions we found decent predictive power in five countries (US, Germany, UK, Canada and Australia, Table 5). In Japan, France and Italy, the (pseudo) RSquare of the regression is close to zero. In Japan and Italy, even the coefficient linking yield curve to recession does not make sense — it has a positive sign implying steepening yield curve is associated with higher risk of recession. With the caveat that these are simple univariate models predicting a complex phenomenon i.e. recession, the average probability of recession in next one year based on yield curve is 26% in US, 29% in Germany, 12% in UK, 24% in Canada and 3% in Australia (Table 5).

Figure 7: CTA Signal Flipped Late-2018 / Early-2019

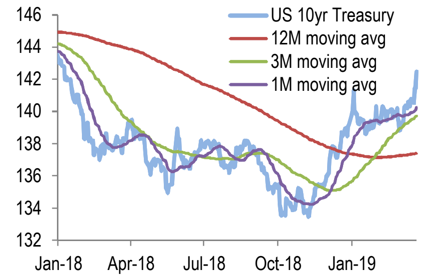


Figure 8: Hedge Fund Positioning Low

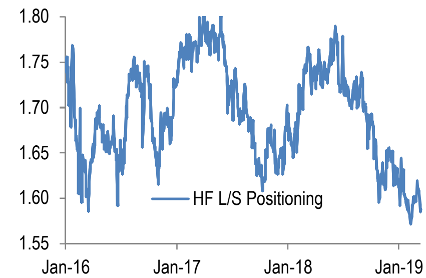


Figure 9: Inflation Then-and-Now

Median of Past Recessions

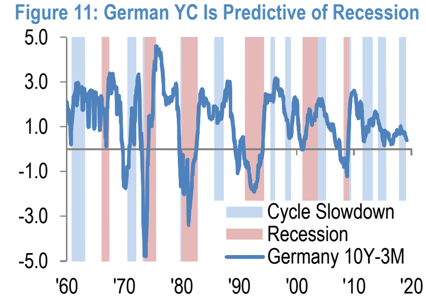
	Median	Current
Real Fed Fund Rate	3.1	0.3
US CPI Inflation	4.8	1.5
UofM 5-year inflation expectation	3.0	2.3
PMI Prices Paid, 12-month change	75.2	53.4

Figure 10: Asset Prices Then-and-Now

Median of Past Recessions

	Median	Current
US 10-year Bond Return, YoY	0%	9%
USD Trade Weighted, YoY	0%	4%
S&P 500, YoY	6%	3%
Gold, YoY	37%	-1%
Earning Yield - Bond Yield	-0.36	2.70
Small - Large, YoY Performance	11%	-1%
Dow Transportation -Utilities, YoY	9%	-13%
Moodys BAA-AAA spread	0.8	1.2

Figure 11: German YC Is Predictive of Recession



Source: J.P. Morgan Quantitative and Derivatives Strategy

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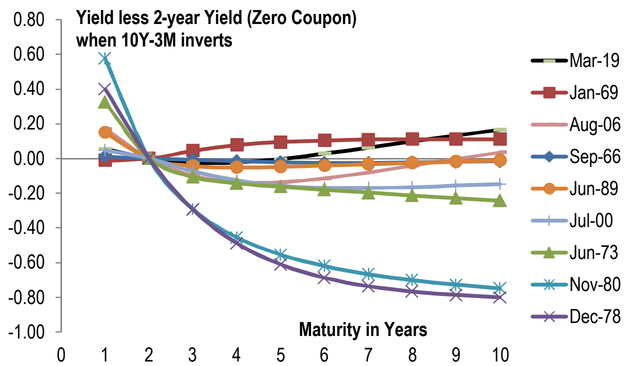
The yield curve currently is steeper than that after typical inversion.

Figure 12: Historical Pattern of Yield Curve When 10Y-3M Inverts

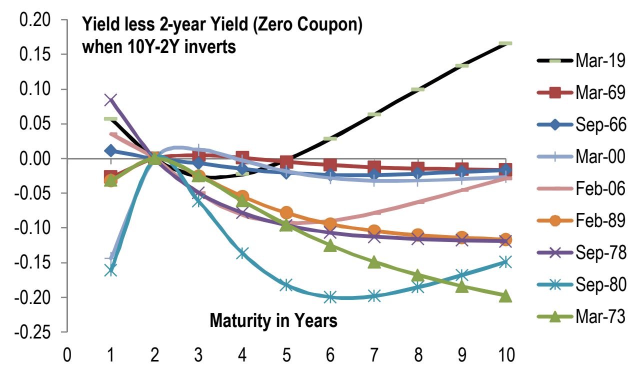
Yields Based on Monthly Average



Source: J.P. Morgan US Equity Strategy and Quantitative Research

Figure 13: Historical Pattern of Yield Curve When 10Y-2Y Inverts

Yields Based on Monthly Average

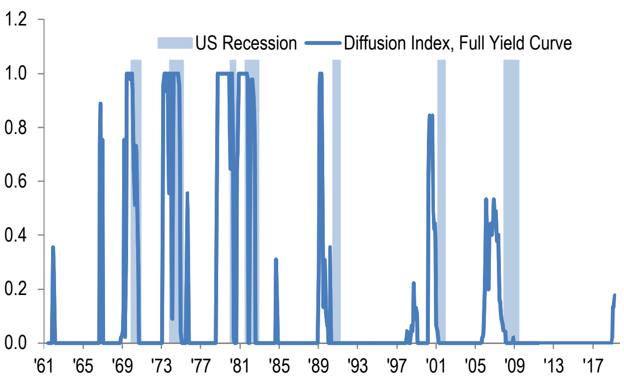


Source: J.P. Morgan US Equity Strategy and Quantitative Research

The full yield curve is not signaling recession. The gap between inversions and recessions has widened in last 3 episodes.

Figure 14: % of Negative Yield Spreads Far Below Past Extremes

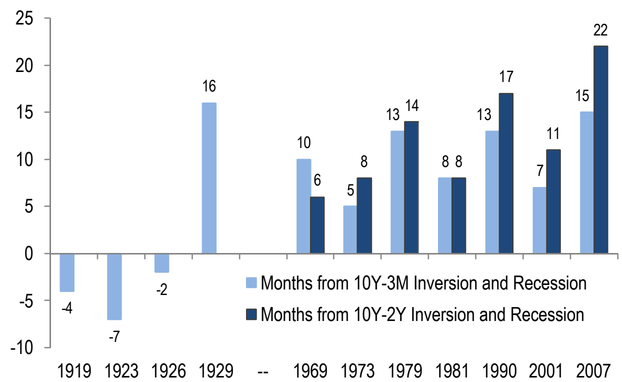
Diffusion=% of negative yield spreads (all longer - shorter maturities yields)



Source: J.P. Morgan US Equity Strategy and Quantitative Research

Figure 15: Median Lead, Yield Curve Inversion to Recession

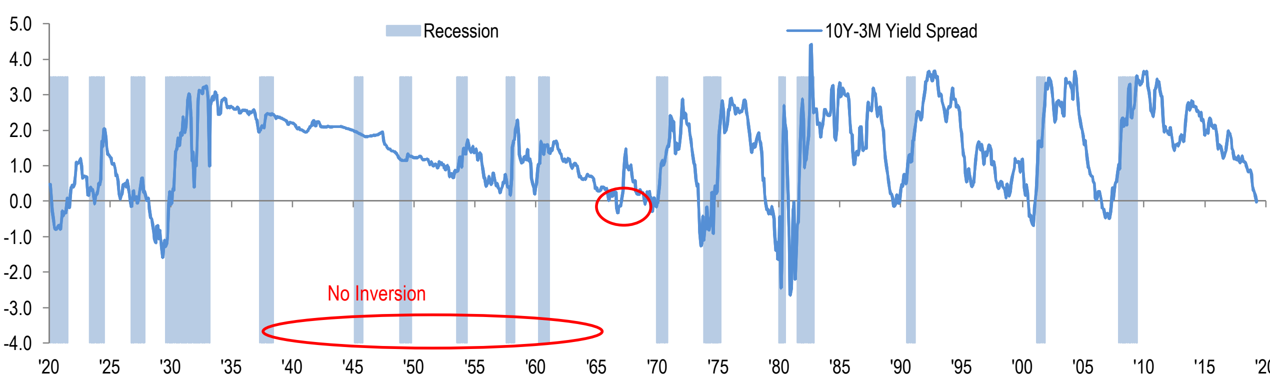
Months from inversion to business cycle peak varies



Source: J.P. Morgan US Equity Strategy and Quantitative Research

Figure 16: US Yield Curve: Term Spread of 10-year Bond Yield and 3-Month T-Bill Rate Has Inverted Prior to 7 of the Last 8 Recessions

Recession's causal link to Yield Curve is not well understood – it did not invert in 6 recessions, 1935 to 1960. YC inverted in 1966 but there was no recession.



Recession bars based on The NBER's Business Cycle Dating Committee's chronology of the U.S. business cycle. Average monthly yield except the last data point (3/26/2019).
Source: J.P. Morgan US Equity Strategy and Quantitative Research, Bloomberg

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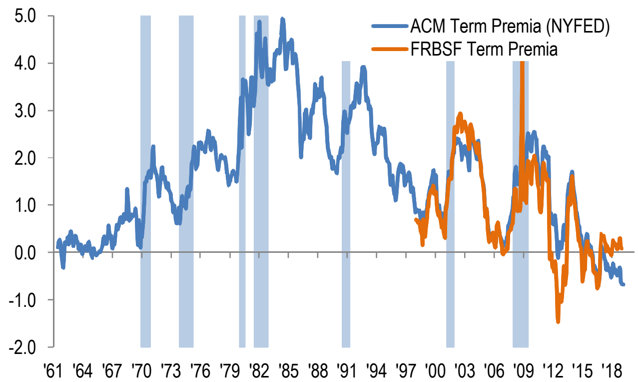
The 10-year Treasury yield decomposition divides the 10-year zero-coupon nominal Treasury yield into the average expected short rate over the next 10 years (risk-neutral rate) and the 10-year term risk premium. The term premium is the excess yield that investors require to commit to holding a long-term bond instead of a series of shorter-term bonds.

Depressed term premia more than expectations of very low future short-term rates has driven the 10-year yield lower recently. The term premium has been largely driven by implied rate volatility, the volatility of medium-term inflation expectations, global FX reserves, and changes in these factors. All of these are unlikely to change soon.

Figure 17: Term Premia at Levels Last Seen in Early 1960s

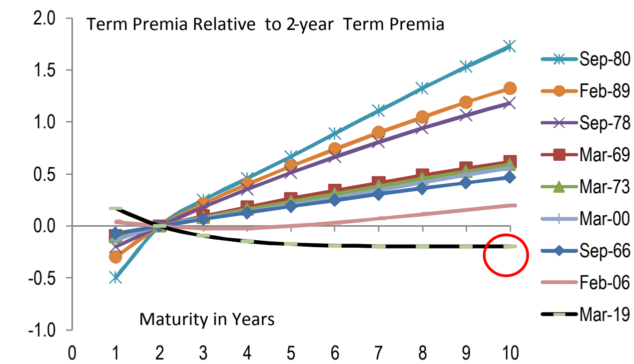
10-Year Bond Term Premia



Source: Federal Reserve, J.P. Morgan US Equity Strategy and Quantitative Research

Figure 18: Term Premia Still Far Below Levels When YC Inverts

Average Term Premia spread in the month 10yr - 2yr spread inverted

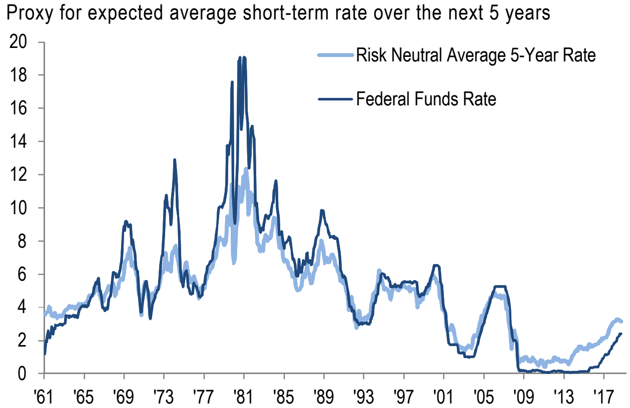


Source: Federal Reserve, J.P. Morgan US Equity Strategy and Quantitative Research

The spread between current Fed Funds rate and the risk neutral average 5-year short-term rate implied by 5-year bond yield now stands far above levels associated with a recession.

Figure 19: Estimated Risk Neutral Rate vs Fed Funds Rate

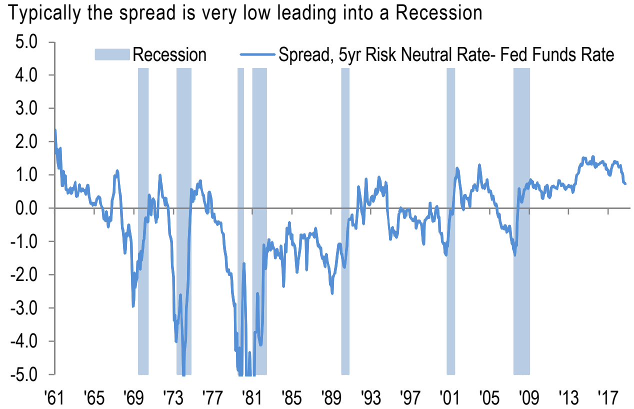
Proxy for expected average short-term rate over the next 5 years



Source: Federal Reserve, J.P. Morgan US Equity Strategy and Quantitative Research

Figure 20: Risk Neutral minus Fed Funds Spread Still High

Typically the spread is very low leading into a Recession



Source: J.P. Morgan US Equity Strategy and Quantitative Research

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Figure 21: S&P 500 Returns vs. 1yr Change in 10yr Bond Yield
Since 1950

	1yr Δ in 10yr Bond Yield	Count	Performance: Last 12Mos	Performance: Next 12Mos	Δ in PE: Last 12Mos	Δ in PE: Next 12Mos	
Lower	-500 to -400bps	4	24%	22%	3.5x	3.8x	Higher
Rates	-400 to -300bps	11	31%	14%	4.2x	1.7x	Multiples
	-300 to -200bps	18	24%	19%	2.9x	2.4x	
	-200 to -100bps	78	8%	8%	0.3x	0.3x	
	-100 to 0bps	256	6%	10%	0.3x	0.5x	
	Rates ↑ (all periods)	**367**	**9%**	**10%**	**0.6x**	**0.6x**	
	Rates ↓ (all periods)	**463**	**9%**	**8%**	**(0.2x)**	**(0.2x)**	
	0 to 100bps	363	10%	8%	(0.1x)	(0.0x)	
	100 to 200bps	76	8%	7%	(0.3x)	(1.1x)	
	200 to 300bps	15	8%	14%	(2.1x)	0.2x	
Higher	300 to 400bps	8	6%	3%	(0.1x)	(0.0x)	Lower
Rates	400 to 500bps	1	8%	(15%)	1.0x	(1.5x)	Multiples

Source: Federal Reserve, J.P. Morgan US Equity Strategy and Quantitative Research

Figure 22: EPS and GDP Growth vs. Yield Curve
Since 1950

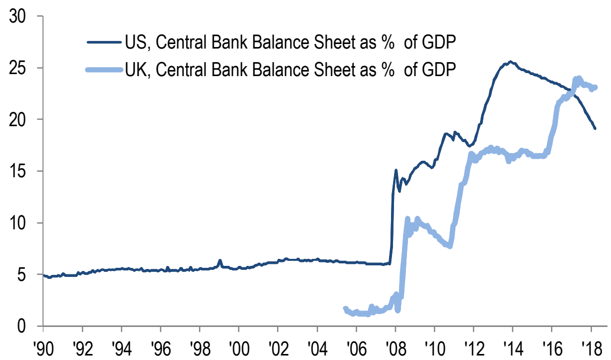
	Yield Curve Inversion (10v3m)	Count	EPS Growth: Last 12Mos	EPS Growth: Next 12Mos	GDP Growth: LTM	GDP Growth: NTM
Inverted YC	-250 to -200bps	3	7.7%	4.3%	1.0%	0.2%
	-200 to -150bps	3	15.1%	1.9%	0.9%	1.0%
	-150 to -100bps	8	17.9%	10.4%	2.9%	(0.2%)
	-100 to -50bps	13	18.2%	2.7%	2.7%	(1.2%)
	-50 to 0bps	47	13.2%	1.9%	3.6%	0.9%
	YC Inversion (all periods)	**74**	**14.4%**	**3.1%**	**3.2%**	**0.4%**
	YC Steeper (all periods)	**756**	**6.5%**	**7.6%**	**3.2%**	**3.5%**
	0 to 50bps	111	11.2%	1.1%	4.2%	2.8%
	50 to 100bps	111	10.3%	4.6%	4.1%	2.8%
	100 to 150bps	166	4.5%	8.0%	4.0%	4.3%
	150 to 200bps	109	5.5%	6.0%	2.2%	3.6%
	200 to 250bps	85	2.2%	4.7%	2.4%	3.5%
	250 to 300bps	103	8.1%	14.0%	2.7%	3.7%
	300 to 350bps	55	3.7%	16.7%	2.3%	2.9%
	350 to 400bps	14	(4.3%)	25.8%	2.0%	2.7%
Steeper YC	400 to 450bps	2	(0.2%)	(14.8%)	(1.8%)	4.5%
	Current		**9.0%***	**3.4%**	**2.9%**	**2.3%**

*2018 excludes estimated benefit from TCJA

Source: J.P. Morgan US Equity Strategy and Quantitative Research, Bloomberg

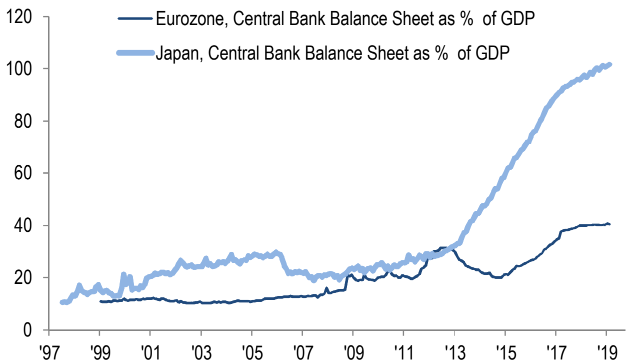
Unconventional global monetary policies, including purchase of government securities, are also artificially suppressing the bond yields. US Fed balance sheet has dropped from a peak 25% of GDP to 19% but G4 balance sheet has dipped only marginally from 37% of GDP to 36% due to continued easing.

Figure 23: US Fed Balance Sheet Contracting But ....



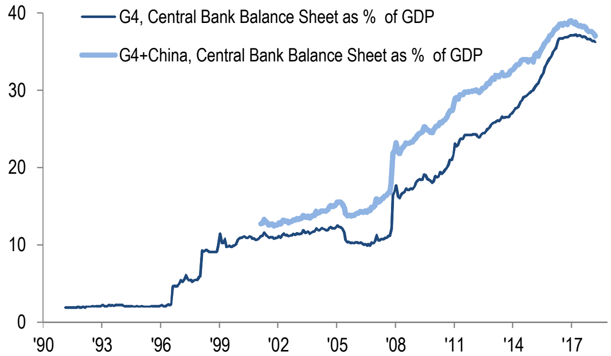
Source: J.P. Morgan US Equity Strategy and Quantitative Research, Bloomberg

Figure 24: ... BoJ and ECB Balance Sheets Still Expanding



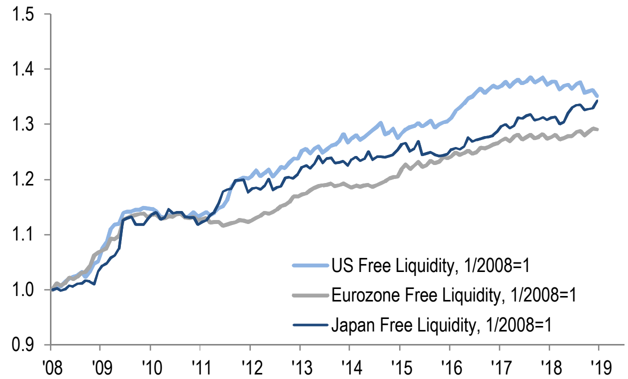
Source: J.P. Morgan US Equity Strategy and Quantitative Research, Bloomberg

Figure 25: Global Balance Sheet High, Including China



Source: J.P. Morgan US Equity Strategy and Quantitative Research, Bloomberg

Figure 26: Free Liquidity, Flat in US, Rising in Japan and Eurozone



Free Liquidity = M2/GDP. Source: J.P. Morgan US Equity Strategy and Quantitative Research

Stronger US growth relative to major developed economies along with relatively higher US nominal and real yields is paradoxically putting downward pressure on US yields. US 10-year bond yield is currently 1.4% and 1.2% higher than the average nominal and real yields of its global peers. By contrast, in the past eight inversions of the yield curve, US yield was -0.8% and -1.5% below the average of its peers.

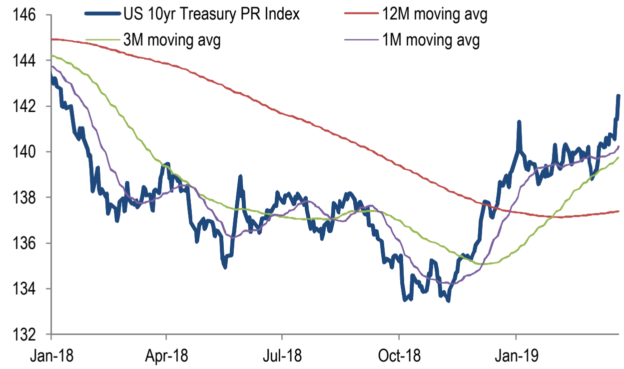
Table 1: US Yields High, Attractive. Nominal and Real 10-Year Yield Spreads When 10Y-3M Yield Curve Inverted in Past

	Sep 66	Jan 69	Jun 73	Dec 78	Nov 80	Jun 89	Jul 00	Aug 06	Median	Current
10-Year Yield Spread										
US-Germany	-3.3	-0.3	-3.0	2.3	4.1	1.5	0.8	1.0	0.9	2.5
US-Japan	NA	-1.0	-0.2	2.9	3.2	2.8	4.3	3.1	2.9	2.7
US-UK	-2.1	-2.3	-3.2	-4.2	-0.5	-2.4	0.9	0.2	-2.2	1.4
US-Canada	-0.6	-1.1	-0.8	-0.7	-0.3	-1.1	0.2	0.6	-0.6	0.9
US-Australia	NA	NA	0.2	0.2	0.3	-5.2	-0.1	-0.9	0.0	0.6
US-France	-1.3	-1.2	-1.3	0.0	-1.0	-0.4	0.6	1.0	-0.7	2.2
US-Italy	-1.0	-0.2	-0.2	-3.9	-3.5	-4.4	0.4	0.7	-0.6	0.1
US-Global7	**-1.8**	**-1.0**	**-1.2**	**-0.6**	**0.5**	**-1.5**	**1.1**	**0.8**	**-0.8**	**1.4**
Real 10-Year Yield Spread										
US-Germany	-3.8	-2.9	-0.9	-4.0	-3.8	-1.0	-1.5	-1.1	-2.2	2.7
US-Japan	NA	-1.8	5.1	-2.3	-2.1	0.4	0.0	-0.8	-0.8	1.3
US-UK	-1.7	-1.1	0.7	-5.0	2.1	-2.3	-2.0	-1.6	-1.6	1.7
US-Canada	0.1	-1.5	0.5	-0.6	-2.4	-1.4	-0.8	-1.2	-1.0	0.9
US-Australia	NA	NA	2.9	-1.1	-3.0	-3.1	0.3	-1.5	-1.3	0.8
US-France	-2.0	-0.7	0.3	0.6	-0.3	-2.0	-1.3	-1.0	-0.8	2.2
US-Italy	-2.6	-4.0	5.4	-1.3	4.9	-3.2	-0.5	-1.1	-1.2	-0.3
US-Global7	**-2.0**	**-2.3**	**2.3**	**-2.4**	**-0.7**	**-1.8**	**-0.8**	**-1.2**	**-1.5**	**1.2**

The dates are months when the term spread (10y-3m) turned negative. The calculation is done over the average spread over the month. Using daily data or weekly data may give different dates which we view as less robust signals. Source: J.P. Morgan US Equity Strategy and Quantitative Research

The steep decline in 10-year yield coincides with flipping late-2018 of momentum signals often used by CTAs. Thus, the market may have initially reacted to an essential technical move in the yield curve rather than a fundamental signal.

Figure 27: Technicals Support for Lower Yield Since Late 2018



Source: J.P. Morgan US Equity Strategy and Quantitative Research

Figure 28: … More So for 10yr German Bund

Source: J.P. Morgan US Equity Strategy and Quantitative Research

Figure 29: Fed Typically Continued Hiking After First Day of 10Y-3M Inversion

Less So When Average Monthly Yields Also Inverted. This Time Fed On Hold after Mar 22 Inversion

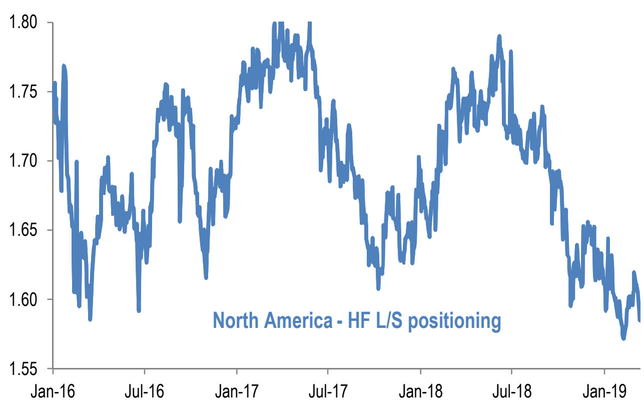
Change in Fed Target rate

	First Month	Post First Day				Post Full Month			
First Day	(average)	1M	3M	6M	12M	1M	3M	6M	12M
1/12/1966	9/30/1966	0.13	0.25	1.00	0.50	0.00	0.00	-1.25	-1.75
12/17/1968	1/31/1969	-0.38	1.00	0.12	3.62	0.37	1.62	1.75	2.62
6/1/1973	6/29/1973	1.00	2.25	0.75	4.75	2.00	0.50	0.50	4.50
11/1/1978	12/29/1978	0.13	0.25	0.25	3.25	0.00	0.00	0.25	4.00
10/27/1980	11/28/1980	1.25	2.25	2.25	1.75	0.00	-2.00	2.00	-4.00
3/28/1989	6/30/1989	0.00	-0.12	-0.75	-1.50	-0.63	-0.63	-1.38	-1.38
4/5/2000	7/31/2000	0.00	0.50	0.50	-1.00	0.00	0.00	-0.50	-2.75
1/18/2006	8/31/2006	0.25	0.50	1.00	1.00	0.00	0.00	0.00	0.00
	Median	0.13	0.50	0.63	1.38	0.00	0.00	0.13	-0.69

Source: J.P. Morgan US Equity Strategy and Quantitative Research

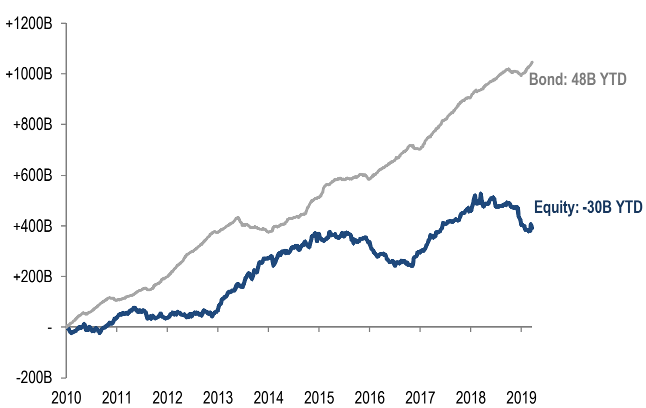
Historically the Fed has hiked rates, on average, by 13bps, 50bps, 63bps and 138 bps after 1, 3, 6 and 12 months after the first inversion day in 10Y-3M. In this cycle, the Fed is expected to remain on hold or even cut rates over the next 12 months. Extrapolating implications of past yield curve inversions can be misleading in the current backdrop.

Figure 30: Hedge Fund Positioning in Equities



Source: J.P. Morgan Prime Brokerage

Figure 31: Outflows from Equity Funds Just Reversing

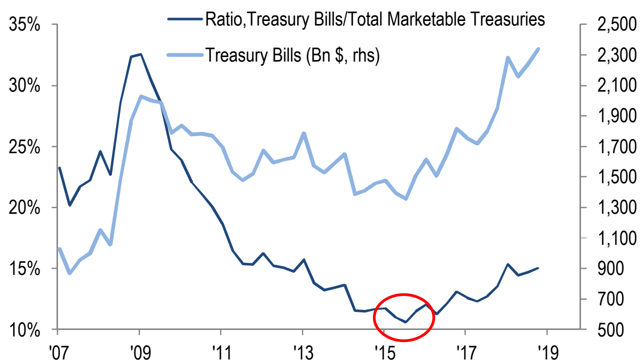


Source: J.P. Morgan US Equity Strategy and Quantitative Research, EPFR

The supply of treasury bills as a share of total marketable treasury securities has been edging up for the past three years from a 60-year low in 2016. On the margin, this would tend to flatten the yield curve (higher T-bill yield relative to T-notes/bonds yield). Similarly, demand for Treasury securities from the rest of the world remains high and underpins lower yields.

Figure 32: Supply: Share of Shorter Maturity Treasuries Increasing

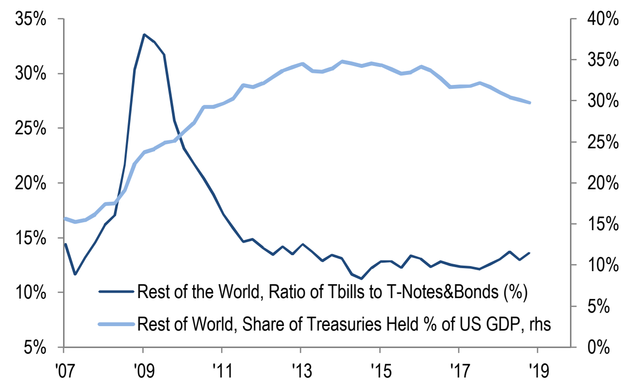
On the margin, may flatten the short end of the yield curve



Source: J.P. Morgan US Equity Strategy and Quantitative Research, Haver

Figure 33: Foreign Appetite for US Treasuries Remains High Though More Muted than Before

Likely neutral for yield curve, share of marketable securities



Source: J.P. Morgan US Equity Strategy and Quantitative Research, Haver

Table 2: Inflation and Its Expectations Are Much Weaker Now than Is Typical When 10Y-3M Inverts, Fed Can Be Patient

	Sep 66	Jan 69	Jun 73	Dec 78	Nov 80	Jun 89	Jul 00	Aug 06	Median	Current
Real Fed Fund Rate	2.3	1.2	5.3	1.5	3.7	5.0	4.0	2.6	3.1	0.3
US CPI Inflation	3.5	4.4	6.0	9.0	12.6	5.2	3.7	3.8	4.8	1.5
U of Mich. 5yr inflation expectations	NA	NA	NA	NA	NA	NA	2.8	3.2	3.0	2.3
PMI Prices Paid	73.7	77.1	87.6	84.5	76.7	50.0	62.4	72.4	75.2	53.4

Source: J.P. Morgan US Equity Strategy and Quantitative Research

Table 3: Growth Is More Moderate than Usual When 10Y-3M Inverts. No Overheating to Fight, Fed Can Be Patient

	Sep 66	Jan 69	Jun 73	Dec 78	Nov 80	Jun 89	Jul 00	Aug 06	Median	Current
PMI Manufacturing	58.7	54.9	65.0	59.4	58.2	47.3	52.5	53.7	56.6	54.2
PMI Manufacturing, change	-2.3	-1.7	6.4	-0.4	10.2	-12.0	-1.1	1.3	-0.8	-5.1
Industrial Production YoY	9.2	5.3	8.8	7.0	-1.3	0.8	4.2	2.4	4.8	3.5
Industrial Production YoY, 12M change	-0.7	2.2	0.1	1.0	-1.5	-4.9	-1.5	-1.3	-1.0	-0.1
US GDP YoY	6.0	5.0	6.3	6.7	-1.6	3.7	5.3	3.1	5.2	3.1
US GDP YoY, 12M change	-0.3	2.3	1.0	1.7	-4.0	-0.8	0.6	-0.5	0.2	0.5
Initial Jobless Claims, 4W Avg.	NA	194.8	240.5	350.3	411.0	339.0	298.5	314.3	314.3	229.3
Initial Jobless Claims, 12M change	NA	-21.0	-54.3	-7.5	-7.5	30.8	-2.3	-1.5	-7.5	1.0
Unemployment Rate	3.7	3.4	4.9	6.0	7.5	5.3	4.0	4.7	4.8	4.0
Unemployment Rate, 12M change	-0.6	-0.3	-0.8	-0.4	1.6	-0.1	-0.3	-0.2	-0.3	0.0
PMI Manufacturing	58.7	54.9	65.0	59.4	58.2	47.3	52.5	53.7	56.6	54.2

Source: J.P. Morgan US Equity Strategy and Quantitative Research

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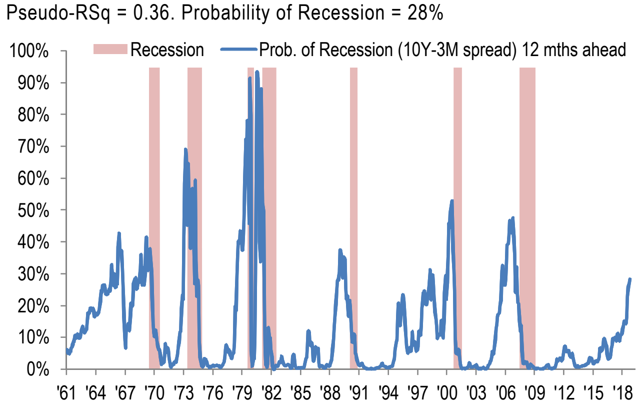
Table 4: At Inversions Leading to Recessions, Typically Riskier Assets Have Done Well, Bond Is flat. Currently, the Opposite Is True

	Sep 66	Jan 69	Jun 73	Dec 78	Nov 80	Jun 89	Jul 00	Aug 06	Median	Current
US 10-year Bond Return, YoY	-2%	2%	1%	-1%	-3%	14%	4%	0%	0%	9%
USD Trade Weighted, YoY	0%	0%	-7%	-5%	1%	13%	0%	-2%	0%	4%
S&P 500, YoY	-13%	7%	-3%	2%	31%	20%	7%	5%	6%	3%
Gold, YoY	NA	NA	NA	37%	49%	-14%	8%	44%	37%	-1%
Earning Yield - Bond Yield	2.25	-0.31	-0.41	3.10	-1.72	-0.63	-2.33	1.27	-0.36	2.70
Small - Large, YoY Performance	16%	16%	-31%	17%	19%	-3%	7%	0%	11%	-1%
Dow Transportation -Utilities, YoY	14%	18%	-37%	7%	50%	11%	-22%	3%	9%	-13%
Moody's BAA-AAA spread	0.6	0.7	0.8	0.8	1.7	0.9	0.7	0.9	0.8	1.2

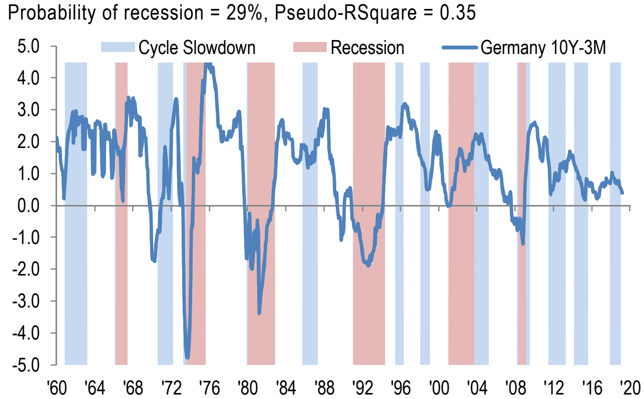
Source: J.P. Morgan US Equity Strategy and Quantitative Research

Figure 34: Est. Probability of US Recession 12-months Forward
Pseudo-RSq = 0.36. Probability of Recession = 28%



Source: J.P. Morgan US Equity Strategy and Quantitative Research

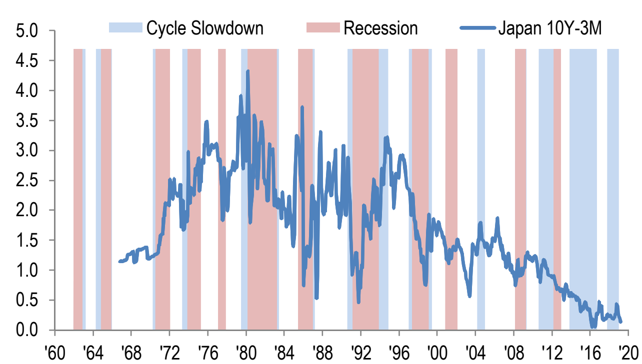
Figure 35: Germany — Yield Curve Behavior Most Like US
Probability of recession = 29%, Pseudo-RSquare = 0.35



Source: J.P. Morgan US Equity Strategy and Quantitative Research

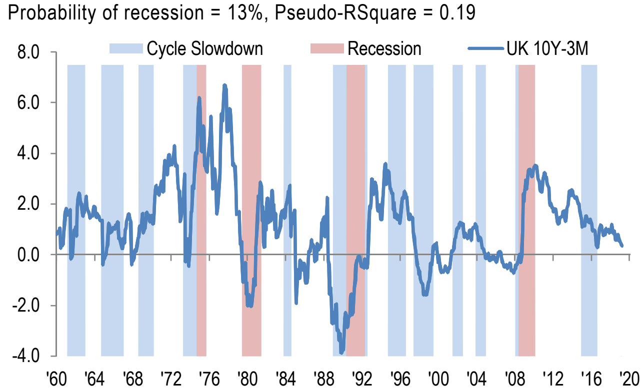
Yield curve does not invert before recessions in all countries, probably on account of time varying country-specific risk premia.

Figure 36: Japan Term Spread – No Inversion Since 1960s
A poor fit. Probability of Recession = 12%, Psuedo-RSquare = 0.08



The 10-year minus 2-year spread inverted in 1989.
Source: J.P. Morgan US Equity Strategy and Quantitative Research

Figure 37: UK Term Spread Inverted in 2000, No Recession
Probability of recession = 13%, Pseudo-RSquare = 0.19



Source: J.P. Morgan US Equity Strategy and Quantitative Research

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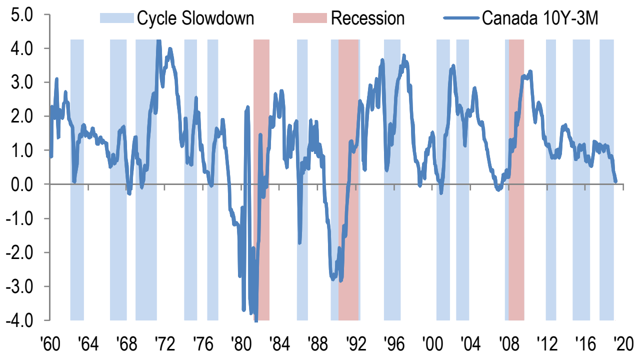
Figure 38: Canada Term Spread Inverted in 2000, No Recession

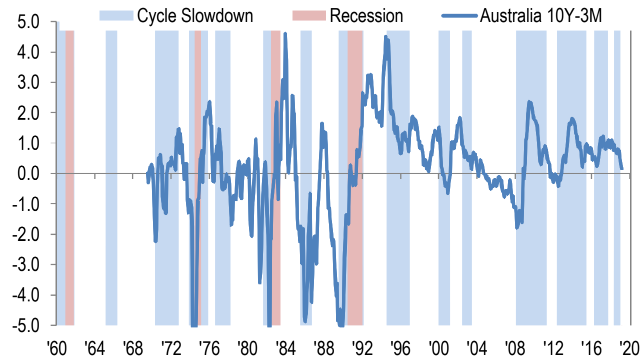
Probability of recession = 13%, Pseudo-RSquare = 0.46



Source: J.P. Morgan US Equity Strategy and Quantitative Research

Figure 39: Australia – No Recession Since 1990, Many Inversions

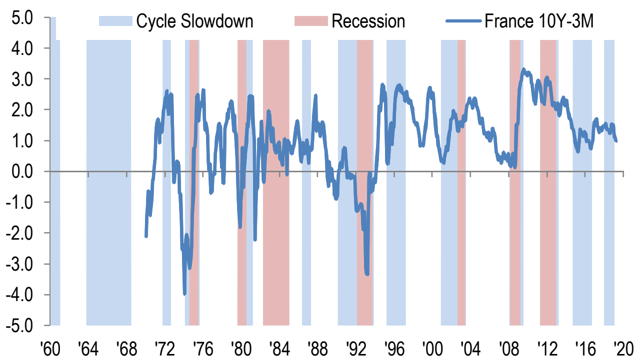
Probability of Recession = 4%, Pseudo-RSquare = 0.34



Source: J.P. Morgan US Equity Strategy and Quantitative Research

Figure 40: France Spread – Country Premium Higher than Germany

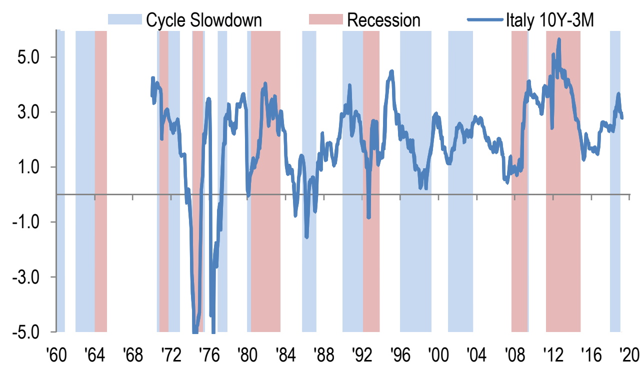
Estimated Probability of Recession = 19%, Pseudo-RSquare = 0.04



Source: J.P. Morgan US Equity Strategy and Quantitative Research

Figure 41: Italy Term Spread – Rising Country Risk Premia?

Estimated Probability of Recession = 27%, Pseudo-RSquare = 0.04



Source: J.P. Morgan US Equity Strategy and Quantitative Research

Table 5: Univariate Probit Model Regression Statistics, Probability of Recession 12-months Forward

	Yield Curve	Start	Probability.	Pseudo R-Sq	Yield Curve Coeff.	T-Stat	Intercept	T-Stat
US	10Y-2Y	Jun-61	24%	0.27	-0.86	-8.2	-1.46	-15.5
	10Y-3M	Jun-61	28%	0.36	-0.88	-9.8	-1.50	-16.0
Germany	10Y-2Y	Sep-90	29%	0.55	-1.28	-9.0	-1.22	-10.0
	10Y-3M	Jun-61	29%	0.35	-0.81	-11.6	-0.96	-14.7
Japan	10Y-2Y	Apr-89	28%	0.00	-0.06	-0.8	-0.67	-9.2
	10Y-3M	Oct-66	12%	0.08	0.32	5.8	-0.58	-10.5
UK	10Y-2Y	Jan-79	12%	0.11	-0.42	-4.9	-1.25	-14.9
	10Y-3M	Jun-61	13%	0.19	-0.56	-7.2	-1.38	-17.9
Canada	10Y-2Y	Jun-89	34%	0.56	-1.49	-6.9	-2.07	-9.4
	10Y-3M	Jun-61	13%	0.46	-0.92	-10.3	-1.82	-16.9
Australia	10Y-2Y	Sep-83	2%	0.37	-0.79	-6.0	-2.25	-11.5
	10Y-3M	Jul-69	4%	0.18	-0.44	-5.7	-1.71	-17.6
France	10Y-2Y	Jan-89	17%	0.04	-0.23	-3.0	-1.00	-12.2
	10Y-3M	Jan-70	19%	0.04	-0.21	-3.6	-0.89	-14.6
Italy	10Y-2Y	May-93	30%	0.05	0.25	3.0	-0.84	-10.0
	10Y-3M	Jan-70	27%	0.04	0.24	3.5	-0.73	-12.5

Source: J.P. Morgan US Equity Strategy and Quantitative Research

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