- **We consider the vulnerability of G10 rates by comparing the recent sell-off to the 'taper tantrum' episode.**
- **A 'taper tantrum' analog suggests that 3 conditions are necessary and sufficient to trigger a significant repricing in term premia: 1) the existence of crowded long positions, 2) a hawkish shift in central bank sentiment and 3) an inflection point/rise in medium term predictors of inflation (aka inflation pressures) causing a shift in stale deflationary views.**
- **We find that the current backdrop in the EZ is strikingly similar to the one in the U.S. in 2013. We note that 1) long rates positioning appears heavily overweight, 2) ECB hawkishness has risen significantly and 3) we have seen an inflection point in underlying EZ inflation pressures.**
- **Although EZ inflation still remains well below target, markets seem complacent with respect to an inflection point in inflation pressures. This increases the risk of a repricing in term premia as we approach a potential tapering in the pace of asset purchases.**
- **A flattish EUR swap curve in the front/belly allows one to gain exposure to a rise in term premium with minimal negative carry.**
- **Tactically, this bodes poorly for our DAX/Bunds/Gold risk parity portfolio although we would want to see a more sustained rise in inflation pressures to warrant a change in strategic view.**

The recent sell-off in G10 rates has many of us wondering whether this is the beginning of a more sustained repricing in risk premiums or simply a short-term position unwind.

In today's note, we explore measures of rates positioning and central bank sentiment to better assess vulnerability across G10 curves. We find that G10 rate markets are both crowded on the long side and that central bank hawkishness, as measured by Prattle's central bank sentiment index, has risen over the past month especially amongst European central banks. We also note the inflection point in EZ inflation pressures which tends to lead changes in central bank sentiment.

**Assessing Vulnerability to a Taper Tantrum:**

Assessing the vulnerability of G10 rates to a more significant sell-off has been a difficult task over the course of this cycle. Although both growth and inflation continue to remain on the low side in most DMs, this does not preclude a more significant repricing of risk premia. After all, most of us were unable to anticipate the repricing in US (and global) rates during the taper tantrum episode. For the most part, the ex post narrative was that crowded positions and a shift in underlying flows were responsible for the repricing.

So what are the necessary and sufficient conditions for a taper tantrum/reprice in term premia?

Although crowded positions and a shift in flows are necessary, we would argue that 3 conditions are necessary and sufficient to trigger a significant repricing in term premia as we observed during the taper tantrum: 1) the existence of crowded long positions, 2) a hawkish shift in central bank sentiment and 3) an inflection point/rise in medium term predictors of inflation (aka inflation pressures) causing a shift in stale deflationary views.
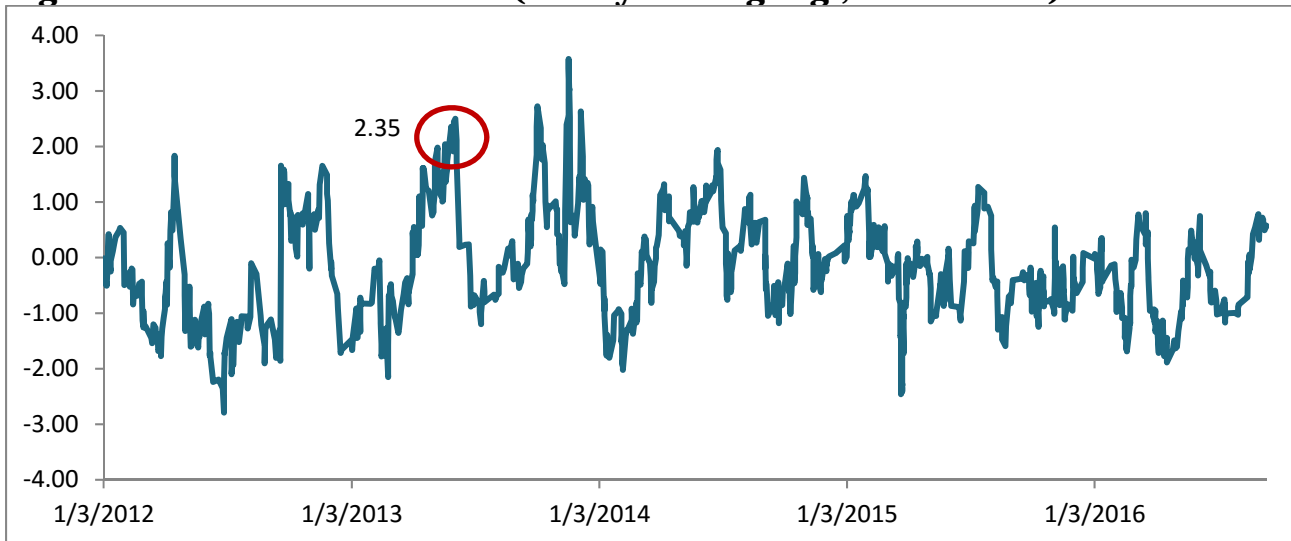
The Taper Tantrum Analog:

**Figure 1: USD 10Y Positioning Indicator***
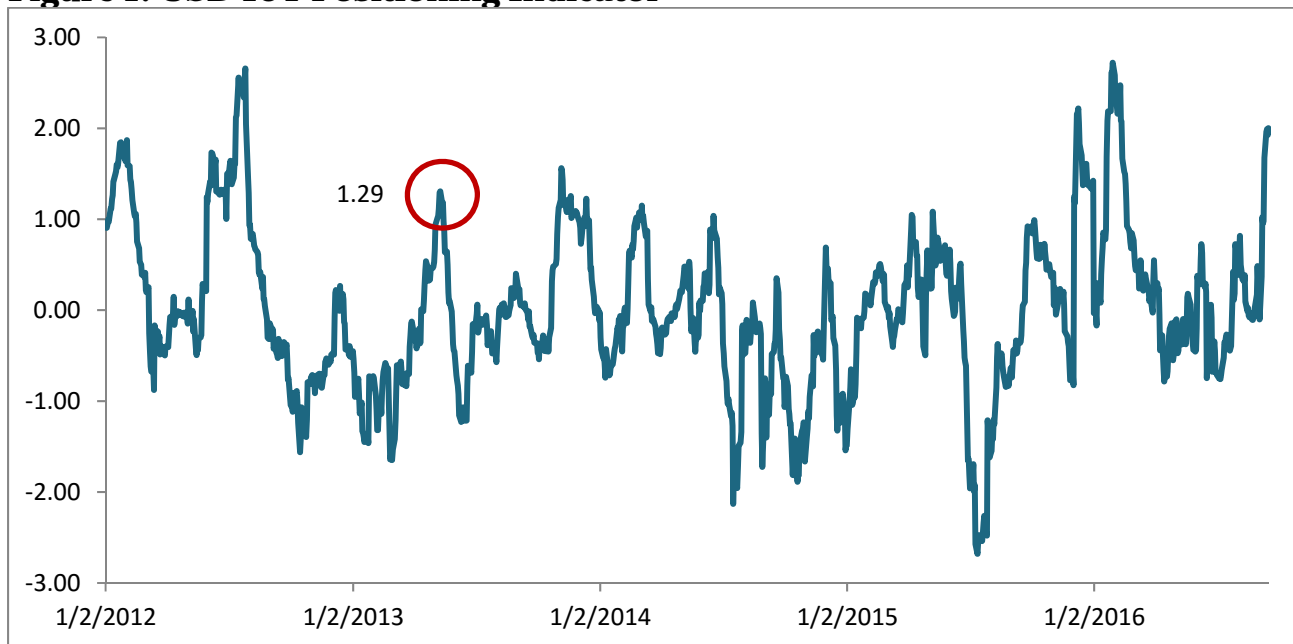
* We define our positioning indicator as the beta estimate of the HFRX Macro Fund Index daily returns regressed on changes in 10Y swap rates. We further standardize the beta converting it into a z-score.

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Figure 2: Fed Sentiment Score (20 day moving avg.; normalized)

Source: Prattle[1]; Drobny Global Advisors

Figure 3: Fed Sentiment Score [1] (recursive sum; normalized) vs. Inflation Pressures Index (IPI)
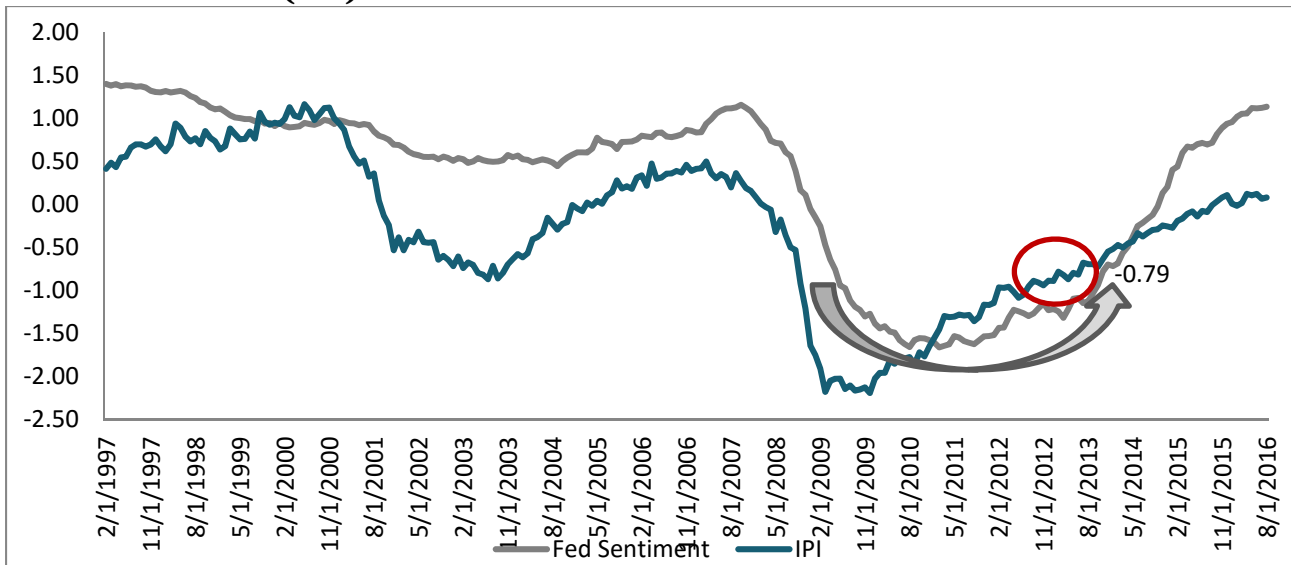
Source: Prattle; Drobny Global Advisors

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[1] Prattle's models are based on the historical relationship between central bank language and market reaction, which is used as basis of evaluation for future communications. The scores are normalized around zero and range between -2 and 2, negative numbers indicating dovishness and positive numbers indicating hawkishness. Visit prattle.co for more information.

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As we will see, the current backdrop in the EZ seems to fit these conditions quite closely.

1) Crowded Positions:

Assessing positioning in any market can be highly subjective. As importantly, we remind ourselves that in aggregate positioning in derivatives are always by definition neutral with only specific trader groups either net long or short.

Using a simple bivariate regression, we can estimate beta exposure of various funds to rates across different points on the curve. Figure 1 shows the normalized (z-score) beta exposure of macro hedge funds (HFRX index) to EUR 10y rates. This estimate suggests that macro funds are currently overweight (+ 1.5 standard deviations from the mean) the back end of the EUR rates curve. We suspect that other trader groups may also be overweight and that this also applies to the front end of the curve.

**Figure 4: EUR 10Y Positioning Indicator***

* We define our positioning indicator as the beta estimate of the HFRX Macro Fund Index daily returns regressed on changes in EUR 10y swap rates. We further standardize the beta converting it into a z-score.

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2) A Hawkish Shift in Central Bank Sentiment:

Although it's reasonably clear that markets have responded somewhat hawkishly to last week's ECB meeting, once again the degree of hawkishness or dovishness is highly subjective. To more objectively assess the change in central bank sentiment, we use a measure developed by Prattle which uses proprietary algorithms to apply natural language/text processing to central bank communications in order to construct objective sentiment scores. Figure 5 shows the change in hawkishness/dovishness as measured by Prattle's central bank sentiment score over the last 20 ECB communications (hawkish scores are positive; dovish scores are negative) and table 1 presents both positioning and central bank sentiment scores across G10. We note the sharp increase in hawkishness as reported by the indicator (+ 1.5 standard deviations from the mean) and that both EUR and SEK curves appear most vulnerable to a hawkish shift.

Figure 5: ECB Sentiment Score (20 day moving avg.; normalized)
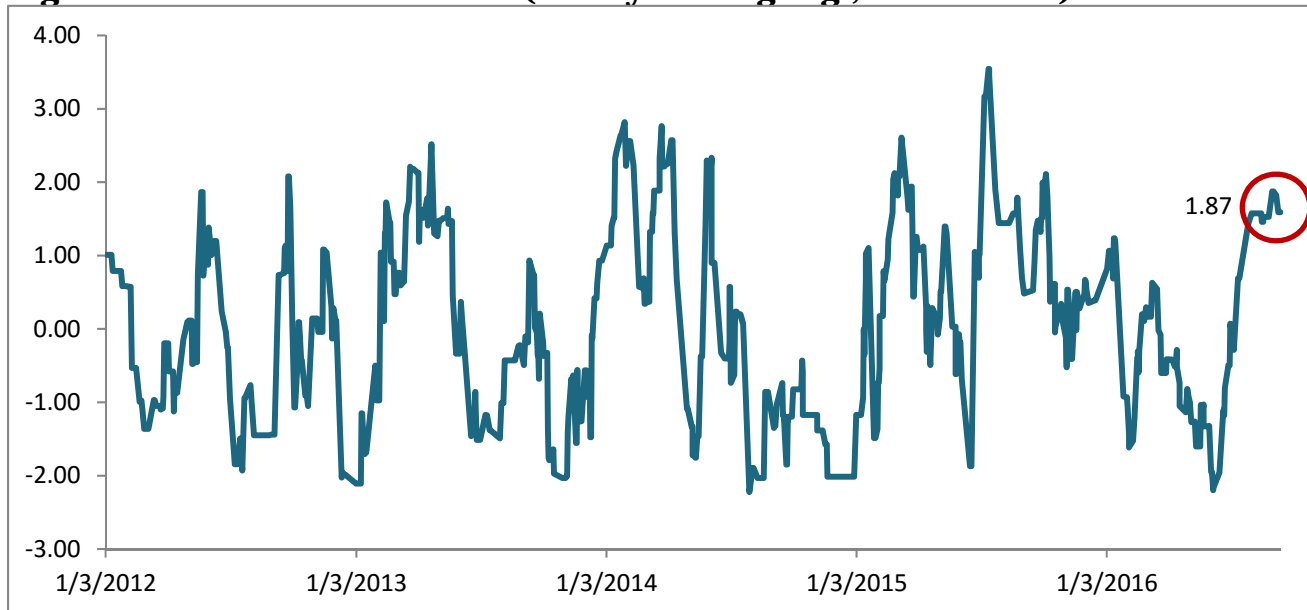
Source**:** Prattle; Drobny Global Advisors

Table 1: G10 10Y Rate Vulnerability:

Country	USD	EUR	GBP	JPY	SNB	BoC	SEK	NOK	AUD	NZD	G10
Prattle Sentiment Index (20d mov. avg.)	0.57	**1.59**	-0.51	-2.78	-0.90	0.01	**2.53**	0.65	-1.21	-0.22	-0.03
DGA Positioning Indicator*	2.00	**1.48**	1.29	1.27	1.40	1.22	**1.21**	1.41	1.73	0.88	1.39

3) An Inflection Point/Rise in Inflation Pressures (i.e. Predictors of Inflation):

Although central bank sentiment can often quickly shift from dovish to hawkish as a result of differing discretionary views across committee members, central bankers are increasingly data-dependent. As more transparency and a forecast-based inflation targeting approach have been adopted, discretionary views amongst speakers have converged somewhat making communications a fairly good descriptive tool for assessing a central bank's monetary policy rule in real-time. This becomes more evident when measures of central bank sentiment such as Prattle's are compared to estimates of the monetary policy reaction function. Figure 6 shows the ECB sentiment score plotted against our ECB Inflation Pressures Index (IPI) which is effectively our estimate for the ECB's monetary policy reaction function (see *Getting Ahead of the Curve*, March 3 2016).

In addition to tracking closely, we can also see that the IPI appears to lead central bank sentiment. This shouldn't be a surprise given the typical sequencing which takes place amongst policy makers in forming views on the appropriate monetary policy stance. This is illustrated in figure 7.

Figure 6: ECB Sentiment Score[2] (recursive sum; normalized) vs. IPI
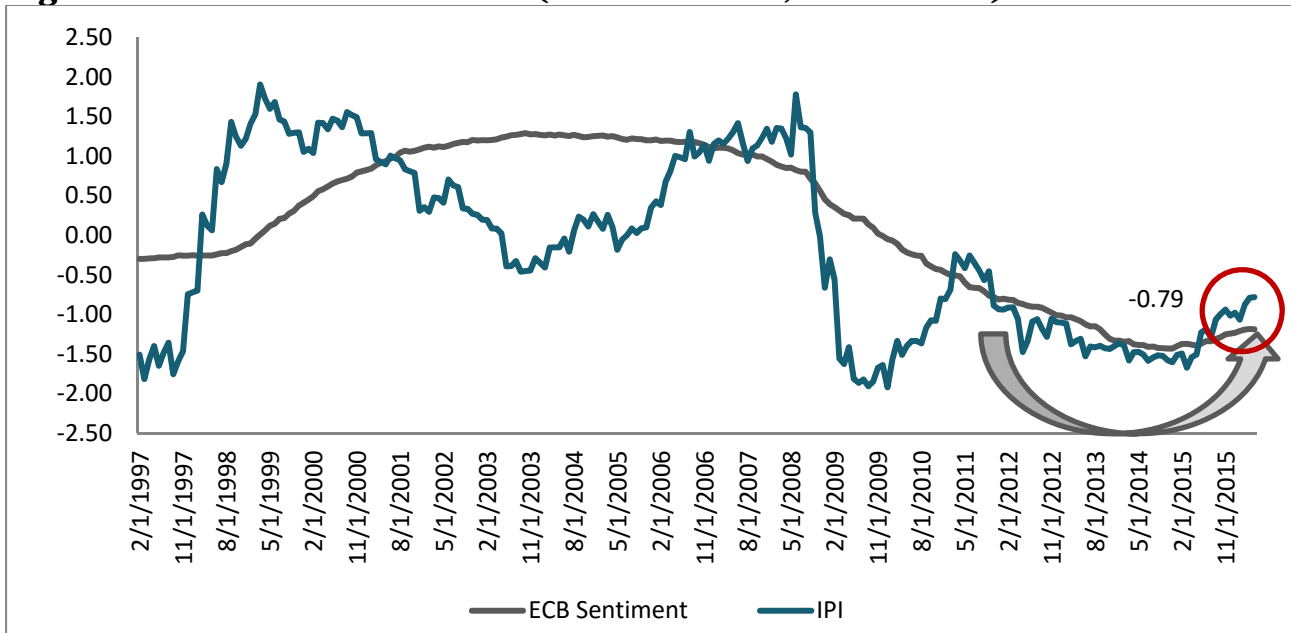
Source: Prattle; Drobny Global Advisors

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[2] We give special thanks to Evan Schnidman, Ken Meyer and the rest of the Prattle team for providing us with the central bank sentiment data: http://prattle.co/

Figure 7: the Monetary Policy Communication Cycle
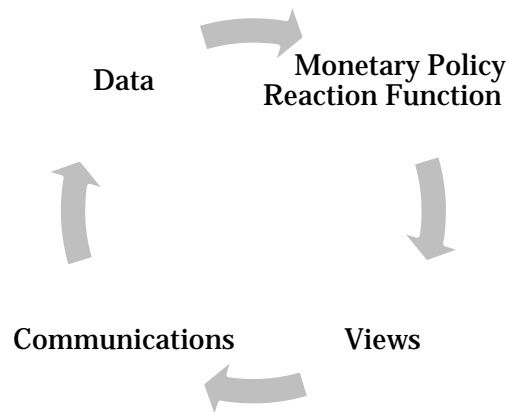
In other words, if one has a reasonably accurate and robust estimate of the monetary policy reaction function, one can anticipate central bank communications. On the other hand, if the estimate of the MPRF is inaccurate or lacks robustness, one should then rely more heavily on central bank communications. This view was recently expressed by Ben Bernanke in a blog post (*https://www.brookings.edu/blog/ben-bernanke/2016/08/08/the-feds-shifting-perspective-on-the-economy-and-its-implications-for-monetary-policy/*).

So what does the ECB's monetary policy reaction function and recent communications tell us?

ECB vs. Fed 'Conditions':

Table 2 compares Fed 'conditions' during the taper tantrum episode with those of the ECB today.

Table 2: Taper Tantrum Analog

Country	Date	FCI (z-score)	LMCI (z-score)	IPI (z-score)	UE Gap	Taper of Asset Purchases
U.S.	5/31/2013	0.31	0.42	-0.79	1.14	12/2013
E.Z.	8/31/2016	0.24	0.20	-0.79	0.74	03/2017

The comparison reveals several striking similarities between both periods:

- Financial conditions are moderately accommodative in both cases with only slightly stronger labor market conditions in the U.S.
- Inflation pressures, although still benign in both cases, are rising as labor market slack declines rapidly. Moreover, the unemployment rate in the EZ is closer to NAIRU (OECB estimates) than it was in the U.S.
- Both central banks expect to taper asset purchases in 6 months.

Although one can point to the difference in headline inflation rates between the two episodes as good reason to invalidate the comparison, we would disagree on the basis that forecast-based inflation targeting central banks are forward looking and place much higher weight on traditional Phillips curve variables such as labor market slack and inflation expectations both of which are captured by our inflation pressures index along with other medium-term predictors of inflation (see Appendix for details). This can be seen in figure 8 and 9.

Figure 8: ECB Inflation Pressures Index vs. Survey of Professional Forecasters Medium-term (18 Months Ahead) Inflation Forecast (Z-Scores)
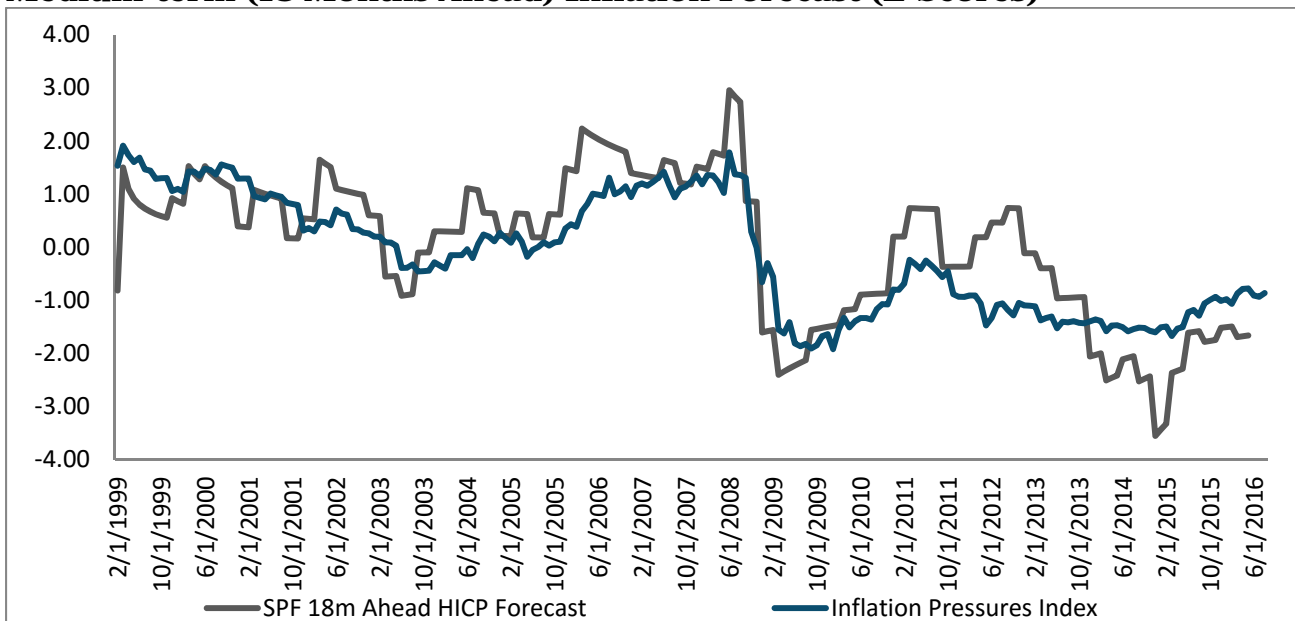
Figure 9: ECB vs. Private Sector Inflation Forecasts

<Menu> to Return										
					Economic Forecasts: European Central Bank					
Eurozone					Actual / Forecasts					
Indicator	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Economic Activity										
Real GDP (YoY%)	-4.5	2.1	1.5	-0.9	-0.3	1.1	2.0	1.7	1.6	1.6
Composite								1.5	1.3	1.5
CPI (YoY%)	0.3	1.6	2.7	2.5	1.4	0.4	0.0	0.2	1.2	1.6
Composite								0.3	1.3	1.6
Unemployment (%)	9.7	10.2	10.2	11.4	12.0	11.6	10.9	10.1	9.9	9.6
Composite								10.2	9.9	9.5

Australia 61 2 9777 8600 Brazil 5511 2395 9000 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000
Japan 81 3 3201 8900   Singapore 65 6212 1000   U.S. 1 212 318 2000   Copyright 2016 Bloomberg Finance L.P.
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Market Implications:

Although EZ inflation still remains well below target, markets seem complacent with respect to the inflection point in underlying inflation pressures. This increases the risk of a repricing in term premia as we approach a potential tapering in the pace of asset purchases in March 2017.

As a result, we look to reduce exposure to our long DAX/Bunds/Gold risk parity portfolio and gain exposure to a further sell-off in EUR rates should market perceptions continue to shift. The front end/belly of the EUR swap curve remains relatively flat (see figure 10) and paying EUR 2y2y looks like a minimal cost way (~ -3 bps/quarter rolldown) to gain exposure to a repricing in euro rates term premium. Using the U.S. 'taper tantrum' analog as a guide where USD 2y2y repriced by more than + 150 bps, we see current asymmetry in EUR rates as reasonably compelling.

Bottom line, we see crowded long rate positions, a hawkish shift in central bank sentiment along with an inflection point in inflation pressures as pointing to higher risk of a euro-driven taper tantrum. Lastly, nominal swap rates are lagging inflation markets which have already repriced higher as shown in figure 11.

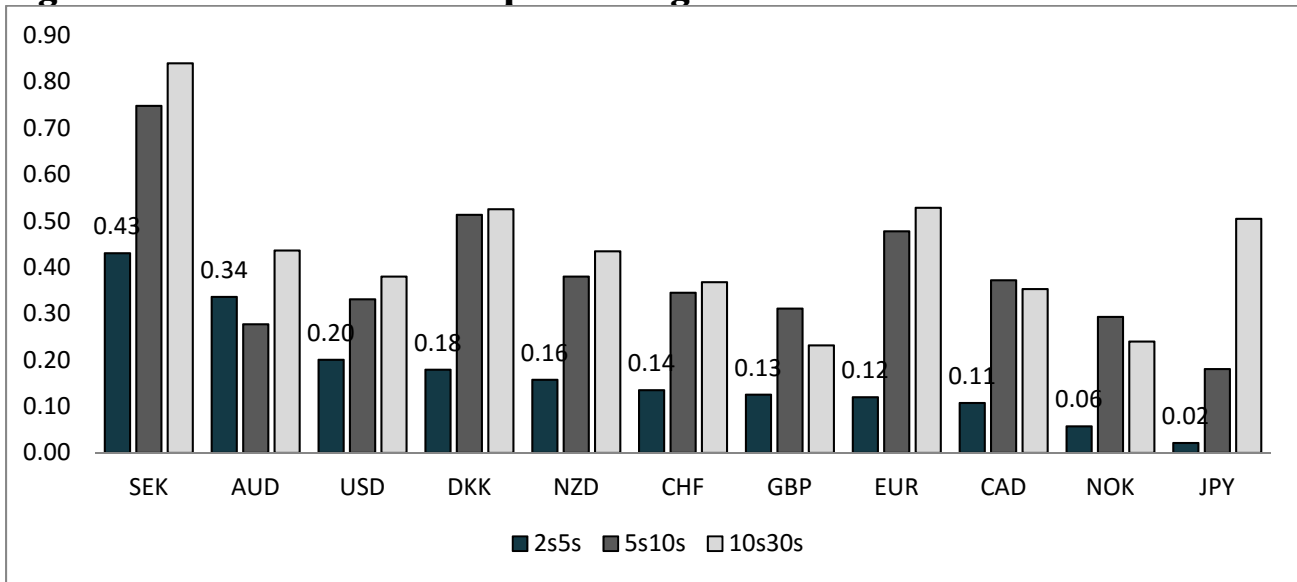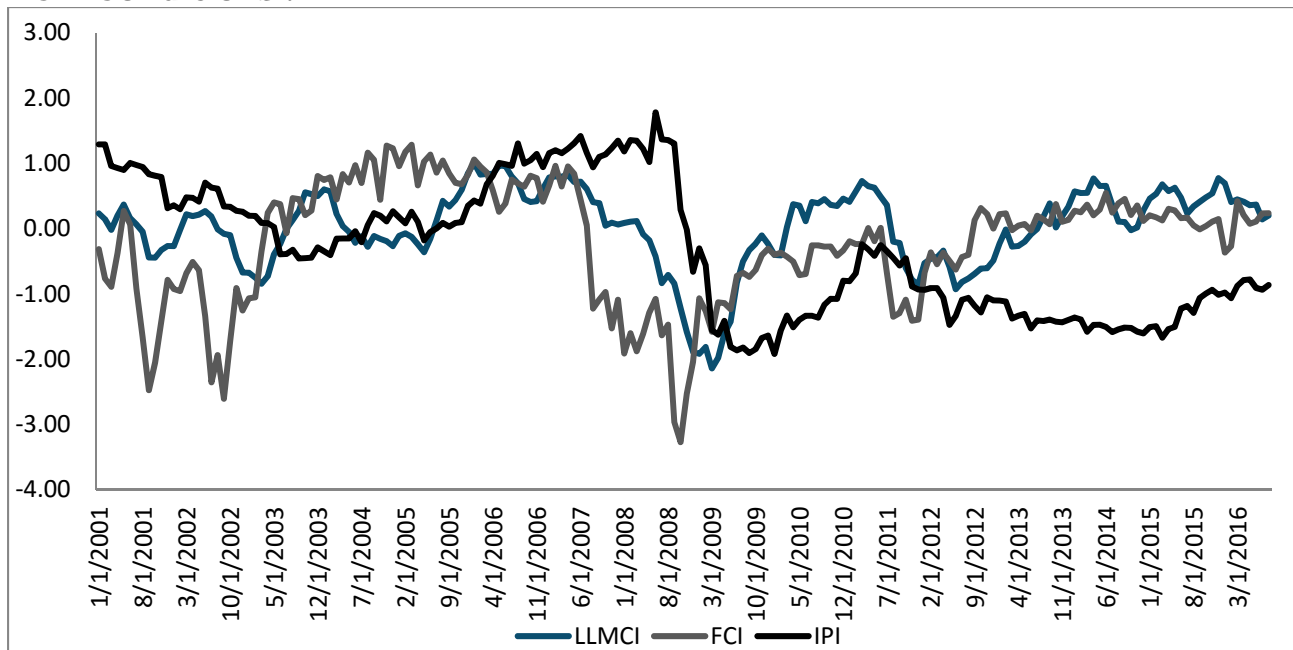## Figure 10: G10 Yield Curve Slope Ranking

Figure 11: EUR 2Y2Y Nominal vs. Inflation Swap Rates

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Appendix

We construct our DGA financial conditions (FCI), leading labor market conditions (LLMCI) and inflation pressures index (IPI) following the same methodology outlined in *Getting Ahead of the Curve*, March 3 2016. Details are provided below.

ECB 'Conditions':

The table below presents the goodness of fit in a target variable horserace where the ECB's normalized Refi rate is regressed on various labor market and inflation indicators (all indicators are standardized by their mean and standard deviation).

OLS Regression of Refi on Target Variables (normalized; 1992-2016)

Labor Market Indicators	R^2	Wage Indicators	R^2	Inflation Indicators	R^2
OECD UE Gap	0.66	Compensation of Employees	0.62	SPF 1y Ahead Inflation Fcst	0.50
Underemployment (Part-time workers)	0.33	EZ IP Wages & Salaries	0.08	1Y1Y Inflation Swap	0.28
				EZ MUICP Energy YoY	0.29
				EZ MUICP Housing YoY	0.28

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This simple horserace exercise shows the extent to which measures of labor market slack and inflation expectations dominate inflation measures in explaining the ECB's behavior when setting policy rates. We conclude that the ECB's behavior is also consistent with a forecast-based rule much like the Fed's. (see *Steepness in a Flatter World – Yield Curve Framework for post Fed Lift Off* Dec 23rd 2015).

ECB Reaction Function – Descriptive Models*
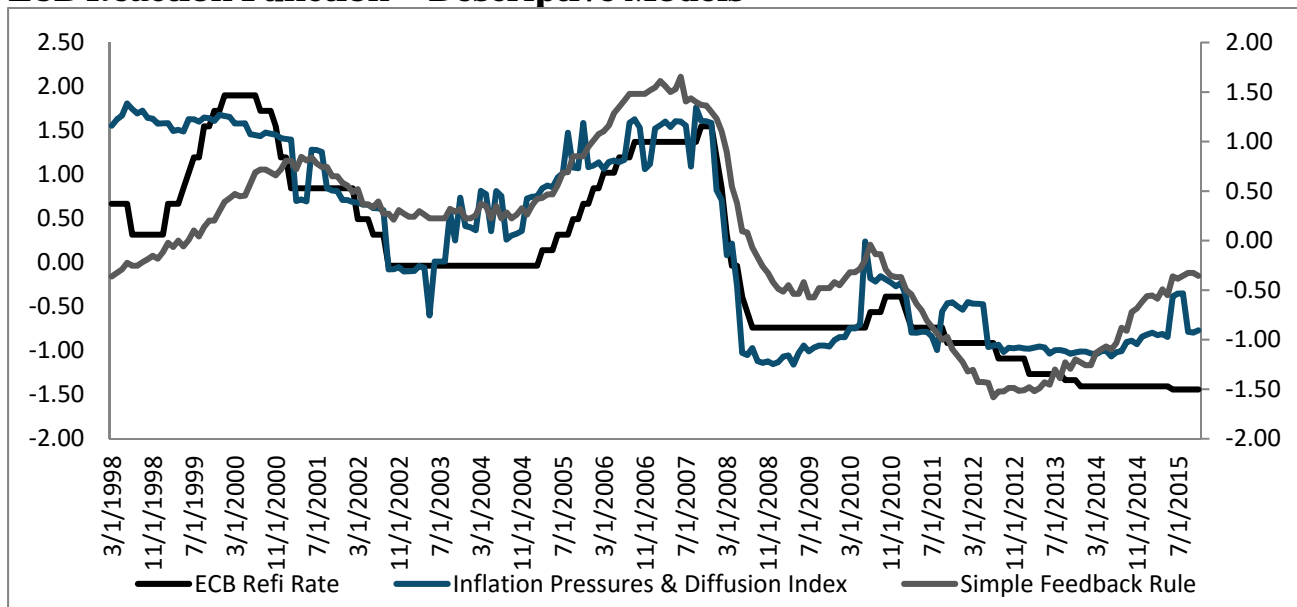
*We regress the Inflation Pressures and Diffusion index measures on the normalized Refi rate; Simple Feedback specification includes the OECD estimated unemployment gap and core HICP inflation gap

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