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Interest Rate Insurance Prices Implicit in Option Prices

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Strong economic growth in Europe and the USA, plus expected stimulus from President Trump, propels stock prices and interest rates higher. Interest rate insurance price distributions are being re-shaped towards normalization.

I. Overview of Recent Events.

Table 1 shows the good news of the sharp recovery in global stock markets in the past year, and especially since the election of Donald Trump as US President. Stocks have increased 9% since the election, and 12% in the 13 months since 12/31/2015. Trump has promised great stimulus with major fiscal spending on infrastructure, which appears to be rather widely agreed to be necessary. Also, Trump promises of reduction in regulations and a more pro-business attitude has boosted stocks. This combination is rejuvenating "animal spirits" in the U.S. and several other major economies.

Table 1

				Global Stock Market Valuation: 17 Trillion Dollar GDP Economies											
2/7/2017 12:48				Bloomberg Data with Prices as of close February 3, 2017											
	2/3/2017 Price	11/4/2016 Price	11/4/2016 %Chg Price	%Price Chg 12/31/2015	2/3/2017 EPS Fwd 12	11/4/2016 EPS Fwd 12	%Chg Fw12 EPS Fcst	Last 12mo EPS LTM	Last 12mo P/E LTM	Fwd 12 P/E 2016	Fwd 12 P/E 2017	CPI LTM Inflation	Fwd E/P Real (-Infl)	2-Year Hi Price	StkPrice Off High
Americas				2/3/2017				2/3/2017	2/3/2017	6/8/2016	2/3/2017		Eq. Risk Prem		
United States	2,297	2,085	10%	12%	130.9	127.0	3%	108.7	21.1	17.4	17.5	1.9%	3.8	2,297	0%
Canada	15,476	14,509	7%	19%	917.5	878.9	4%	666.8	23.2	18.2	16.9	1.3%	4.7	15,685	-1%
Brazil	64,954	61,598	5%	50%	4990.4	4436.6	12%	245.7	264.3	13.3	13.0	5.0%	2.7	66,190	-2%
Mexico	47,225	46,695	1%	10%	2738.4	2616.2	5%	1953.1	24.2	20.1	17.2	3.0%	2.8	48,695	-3%
Europe															
Germany	11,651	10,259	14%	8%	860.3	811.3	6%	654.6	17.8	12.6	13.5	2.5%	4.8	12,391	-6%
France	4,825	4,377	10%	4%	350.0	318.2	10%	200.9	24.0	14.2	13.8	1.6%	5.7	5,284	-9%
United Kingdom	7,188	6,693	7%	15%	512.7	454.0	13%	119.8	60.0	16.3	14.0	2.4%	4.7	7,338	-2%
Italy	19,116	16,319	17%	-11%	1553.5	1261.8	23%	344.0	55.6	13.7	12.3	0.7%	7.4	24,157	-21%
Spain	9,463	8,792	8%	-1%	711.0	631.0	13%	407.9	23.2	13.5	13.3	3.5%	4.0	11,885	-20%
Russia	1,190	971	23%	57%	172.7	146.6	18%	109.5	10.9	7.5	6.9	4.4%	10.1	1,280	-7%
Turkey	88,390	74,267	19%	23%	9926.9	8965.3	11%	8847.8	10.0	8.9	8.9	6.6%	4.6	91,806	-4%
Asia/Pacific															
Japan	18,918	16,905	12%	-1%	1153.1	1023.6	13%	821.1	23.0	16.5	16.4	0.7%	5.4	20,953	-10%
Australia	5,622	5,181	9%	6%	357.9	327.9	9%	211.3	26.6	17.0	15.7	1.2%	5.2	5,997	-6%
South Korea	2,073	1,982	5%	6%	217.8	185.3	18%	109.0	19.0	10.9	9.5	1.1%	9.4	2,190	-5%
China	3,140	3,125	0%	-11%	237.3	233.2	2%	173.6	18.1	12.7	13.2	1.8%	5.8	5,178	-39%
India	28,241	27,274	4%	8%	1646.7	1651.7	0%	1338.4	21.1	18.5	17.2	2.2%	3.6	30,025	-6%
Indonesia	5,361	5,363	0%	17%	368.0	325.9	13%	221.8	24.2	15.1	14.6	2.5%	4.4	5,524	-3%
Averages			9%	12%			10%		39.2	14.5	13.8		5.2		-8%
10-Year TreasYld	2.46	1.78													
VIX	11.0	22.5													

[1] I thank Song Xiao and Gloria Zeng of Duke for excellent research assistance.

The Fed's rate hike in December, plus the expectation of several more to come in the next couple of years, is boosting financial stocks and insurance companies, which benefit from higher rates. The 10-year US Treasury rate has jumped from 1.78% pre-election to 2.46% on Friday, February 3rd. At the same time, the 10-year German bund yield increased from 0.17% to 0.41%, while the UK 10-year Gilt moved from 1.13% to 1.35%.

In the Americas, the USA and Canada's stock markets have done well. However, the stellar performer over the past 13 months is Brazil's 50% increase. Mexico is up 10% over 13 months, but about breakeven since Trump's victory, which is not surprising, given the rhetoric. European stocks have been stellar performers since the US election. Part of that is due to stronger growth in the Eurozone and the UK than had been expected several months ago. Of course, important elections in France, Germany and other countries in Europe are to be played out in coming months. Perhaps not surprisingly, given the admiration of Trump for Putin, Russian stock prices are up 23% since the election and 50% in the past year. In Asia, China has been extremely steady, without large stock price moves, which perhaps is what the government wants. Japan has bounced back sharply, as a weak yen and stronger global growth helps exports, and the higher interest rates globally inhibits the BoJ from its unpopular negative interest rate policy.

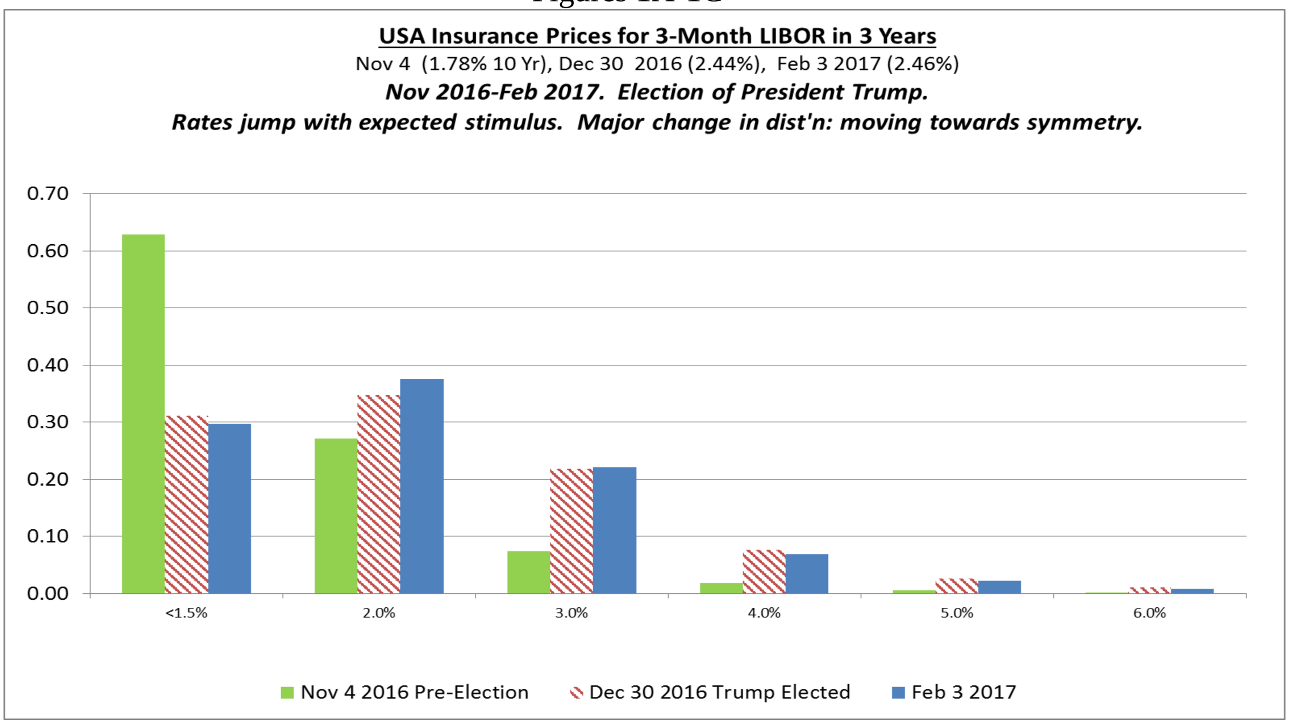
From Table 1, we can also see that 12-month forward earnings forecasts are about 10% higher on average than they were pre-election. Part of that is due to the rolloff of a bad quarter, but part of it also appears to be increased optimism for corporate profits, especially in Europe and Asia. It is also notable that, despite the substantial increase in stock prices, earnings have increased even more, so that the average global forward price/earnings ratio has actually gone down in the last 8 months from 14.5 in June 2016 to 13.8 today. Thus, the current stock valuation story seems to be one of earnings growth, which is offsetting higher discount rates.

All in all, there is a great deal of economic optimism at present, which is causing rates to be higher and is increasing the likelihood of diminished central bank monetary stimulus, something I personally have felt has been the right direction for several months, if not 1-2 years. I think central banks in the USA, Europe, the UK and Japan have all been too slow to normalize. I am so relieved that many economies are on a normalization course now, as I think that massive government stimulus is inappropriate, given global economic growth and much-reduced unemployment. Markets allocate resources much better than governments do, so weaning away from central bank stimulus and getting interest rates back to normal are moves I applaud heartily.

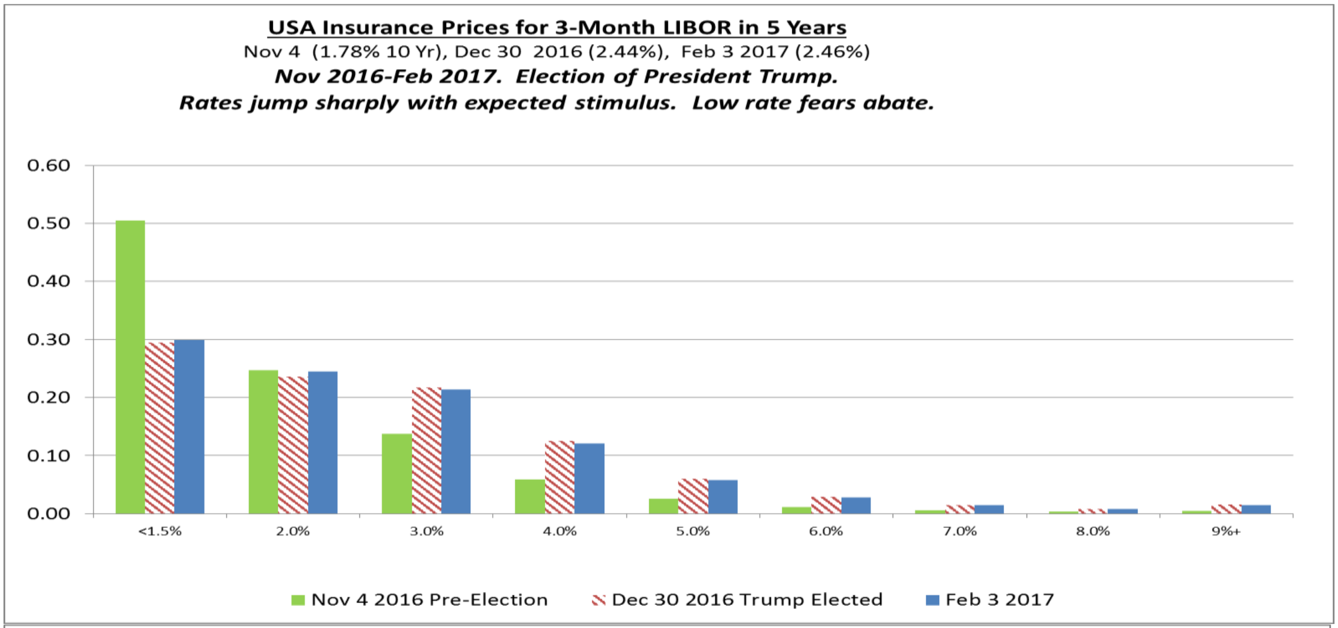
II. USA: Interest Rate Insurance Prices for USA LIBOR 3, 5, and 10 Years Out

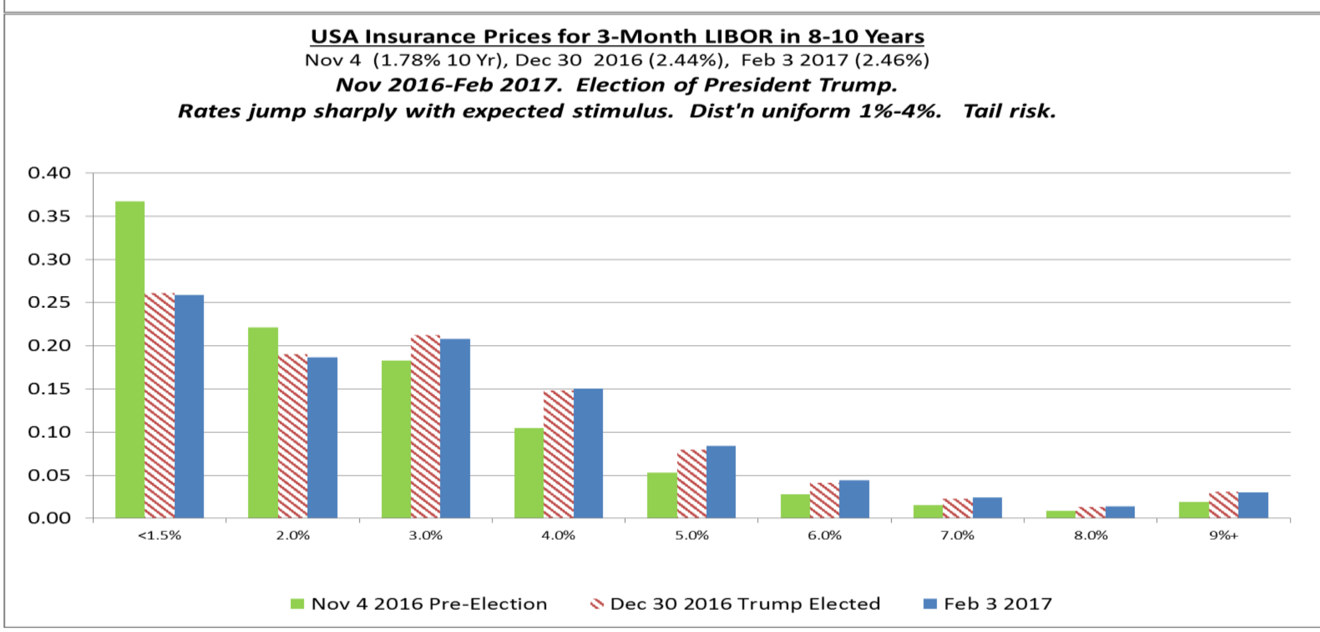
Let's turn to our usual graphic analysis of the interest rate insurance prices that are implicit in the prices of caps and floors, using the technique of Breeden and Litzenberger (1978, 2014). Using prices from Bloomberg Financial Markets, we see in Figures 1A-1C the prices for interest rate insurance for 3-month LIBOR rates in 3, 5 and 8-10 years. Given the 68 basis points increase in the 10-year rate from 1.78 to 2.46 post-election, combined with the Fed's December rate increase and growing expectations for more in 2017, the interest rate insurance price distribution has changed quite dramatically, reminding me of 2013, when Bernanke said the economy was strong and tapering could begin. The 3-year insurance prices were very much stacked on the 3-month LIBOR rate being below 1.5% then pre-election, with a high amount of positive skewness in the distribution. At present, post-election, the mode has shifted to 2% LIBOR in 3 years, and the distribution is becoming more symmetric around higher rates, a major shift from recent years of highly skewed distributions.

Figures 1A-1C



The USA distribution of 5-year insurance prices has also moved out towards higher rates. It is nearly uniform now for rates from 1% to 3% in 5 years, with increased prices paid also for 4%, 5% and 6% bets. The long-term, 8-10 year option-implied insurance prices show an almost uniform distribution for LIBOR from 1% to 4%, and lower, (but increased from recent years) prices for 5%, 6% and 7% bets. Increased breakeven inflation rates show that markets see the stimulus ultimately pushing inflation higher.

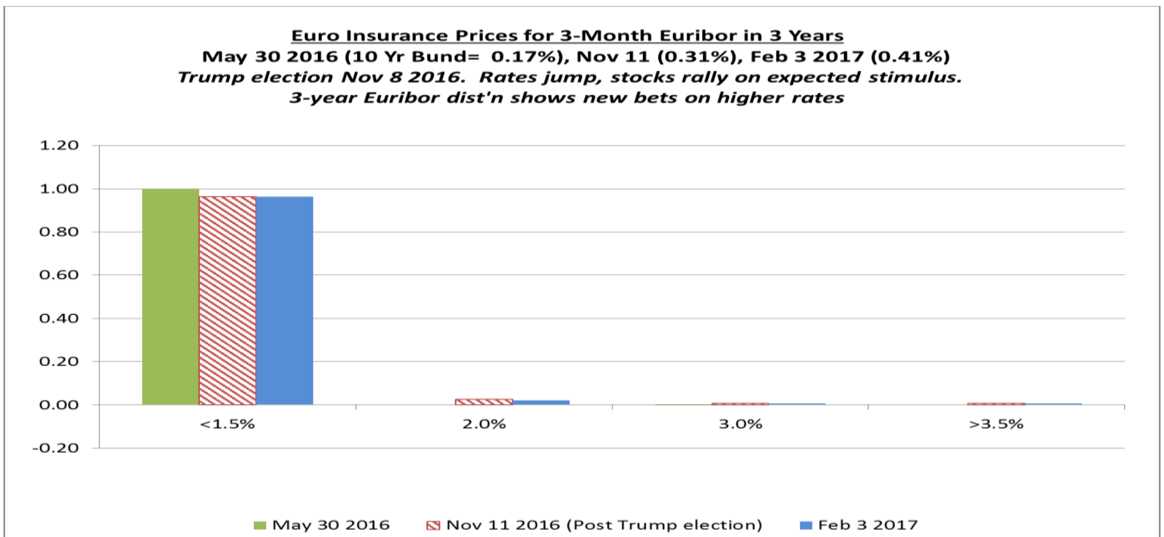


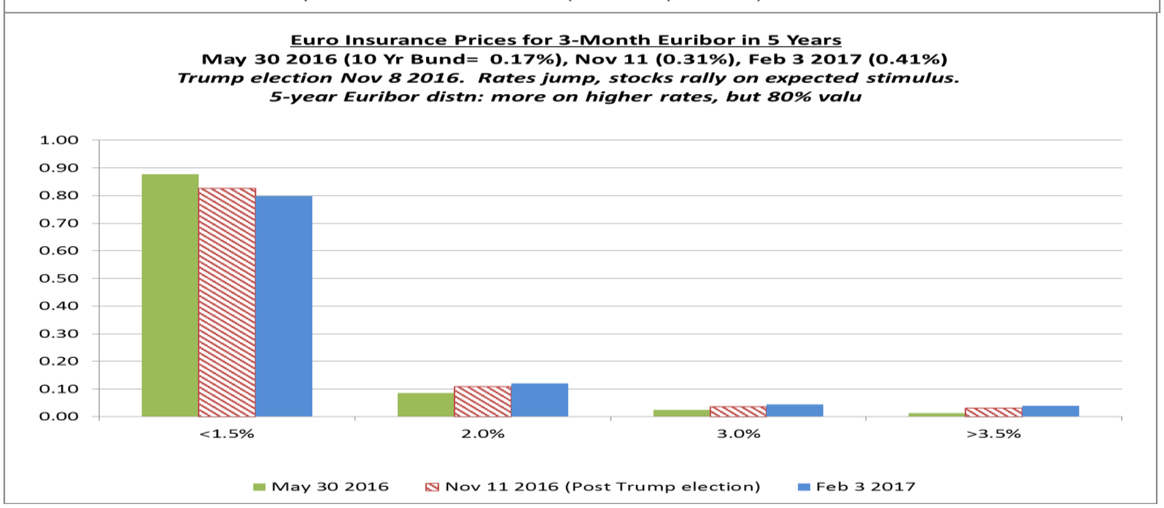


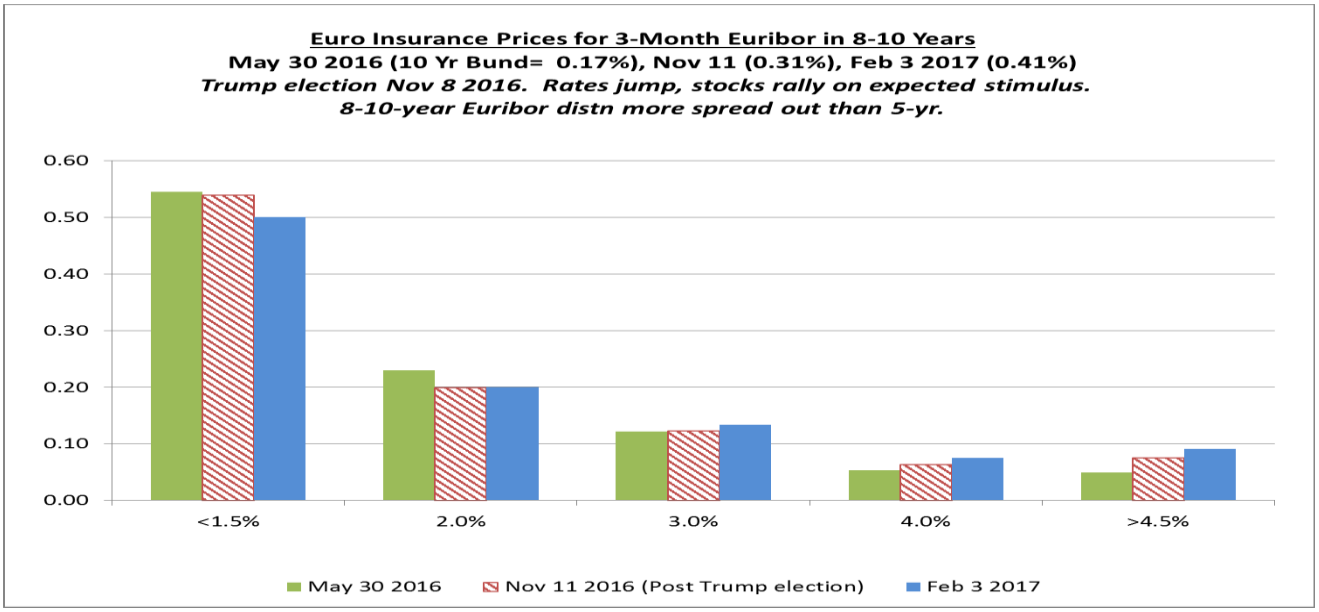
III. <u>Euro Area: Interest Rate Insurance Prices for Euribor 3, 5, nd 8-10 Years Out</u>

Figures 2A-2C give the options markets' pricing of insurance payoffs on Euribor in 3, 5, and 8-10 years, respectively. Of course, Draghi's ECB continues to conduct quite massive stimulus, despite protests from many German economists. While over the next 3 years, almost all of the betting is on Euribor less than 1.5%, there is now a slightly visible bet for 2% and 3% Euribor, which is a change. With the 5-year distribution, the value bets on Euribor above 1.5% are visibly increased, though 80% is still bet on Euribor less than 1.5%, which likely reflects risk aversion as well as probability. Looking at Figure 2C, one sees that the Euribor insurance price distribution gets considerably more spread out over the long term of 8-10 years. The price paid for insurance against rates being less than 1.5% is down to 50%, with 50% now being paid for higher rates.

Figures 2A-2C







IV. U.K: Interest Rate Insurance Prices for Interbank Rates in 3, 5, and 8-10 Years

Figures 3A-3C give the insurance price distributions for the UK interbank interest rate 3, 5 and 8-10 years out. The British pound insurance prices show considerable movement in the past 9 months, with impacts both from Brexit, a surprisingly quick bounce back of the British consumer, and then global stimulus from the Trump rally and the new animal spirits. The 3-year UK interbank rate distribution continues to show heavy pricing for rates below 1.5%, with a price of almost 75% there. Mark Carney's Bank of England continues to be dovish, although it seems they are turning the corner from a bias towards decreasing rates to neutral. I would think that unless the UK falters a lot, they will eventually join the USA in normalizing rates away from the dangerous zero rate equilibrium. I think markets believe that sequence as well, as the pricing of insurance against the bad economy, fear scenario of rates below 1.5% drops from 75% for 3-year to 58% for 5-year and to 48% for 8-10 year UK short rates. Indeed, the 8-10 year insurance prices have such a solid long tail that I would think this reflects relatively bipolar views on the UK economy, with (somewhat like the Eurozone), about half the value being paid for weak economy insurance, and half the value being paid to normalizing rates.

Still, comparing these long-term distributions in the Eurozone and the UK to that for the USA, we see that Europe and Great Britain's 50% price paid for rates less than 1.5% is about double the 25% paid for such insurance for USA rates. Given Britain's and Europe's surprisingly durable growth, I would think there would eventually be some more convergence towards the USA price distribution and a normalization towards more symmetry, at least over the longer term. Again, I would note that very high risk aversion, which we have had since the Great Recession and the Sovereign Debt Crisis, may offset and keep low rate insurance prices elevated for some time to come. But I think those fears will gradually diminish.

Figures 3A-3C