November 2015

Global Markets

Flow Strategy & Solutions

COGNITIVE DISSONANCE OF MARKETS: LIQUIDITY DELUSIONS & CROSS-ASSET VOLATILITY

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KEY MACRO THEMES
& VOLATILITY DISTORTIONS

SG ECONOMICS Q4 OUTLOOK: FIVE ANCHOR THEMES

1. China's real story is nominal

China Growth forecast below-consensus from 6.3% to 6.0% in 2016. 30% probability of a hard landing over the coming year,

2. Emerging economies' balance sheet wobbles

Corporations in emerging economies increased leverage and FX borrowing given cheap liquidity.
Weaker commodity prices and lower domestic currencies forcing balance sheets adjustment and repair.
Fed tightening is seen as an additional headwind.

3. Advanced consumers above trend

Better job prospects and windfall gains from low commodity prices.
But even in China, we find cause to be more constructive on the consumer.

4. Shifting jobs-productivity balance

Continued disappointment on productivity caused by simple measurement issues or Secular Stagnation ?. Our view sits at the less gloomy end of the spectrum. We look for a gradual recovery thereof in the advanced economies

5. Divergence of monetary policies

We expect to see a divergence of monetary policies: gradual Fed and BoE tightening. BoJ, ECB and PBoC are expected to deliver further policy accommodation. In emerging markets too, we look for a range of policy reactions.

RISKS TO CENTRAL CASE

BLACK SWANS: *Fed behind the dots (10%) / New global recession (10%) / US consumer saves more (25%) / China hard landing (30%) / Brexit (45%)*

WHITE SWANS: *US invest more (20%) / Higher-than-expected price multipliers (15%) / Fast track reform (10%).*

SG GLOBAL EQUITY FORECASTS

✓ **EQUITIES :** Europe and Asia to outperform US and the UK. CAC40 and FTSEMIB to lead the euro area.

SG Research global equity index targets									Expected Returns (%)		
Index	**16-Sep**	**Q4 15e**	**Q1 16e**	**Q2 16e**	**Q3 16e**	**end 2015e**	**end 2016e**	**end 2017e**	**end 2015e**	**end 2016e**	**end 2017e**
S&P 500	2,101	2,050	2,100	2,050	2,100	2,050	2,100	2,050	-2%	0%	-2%
DJ Stoxx 600	377	385	410	415	420	385	425	450	2%	13%	19%
Eurostoxx 50	3,430	3,500	3,750	3,900	4,000	3,500	4,200	4,500	2%	22%	31%
FTSE 100	6,363	6,600	6,700	6,600	6,500	6,600	6,500	7,000	4%	2%	10%
CAC 40	4,916	5,000	5,400	5,600	5,800	5,000	6,000	7,000	2%	22%	42%
DAX 30	10,917	11,000	11,250	11,500	12,000	11,000	12,000	13,000	1%	10%	19%
FTSE MIB	22,392	24,000	26,000	27,000	28,000	24,000	29,000	33,000	7%	30%	47%
IBEX 35	10,438	10,000	10,600	11,250	11,500	10,000	11,500	13,000	-4%	10%	25%
SMI	8,917	9,200	9,400	9,300	9,200	9,200	9,000	9,000	3%	1%	1%
Nikkei 225	18,683	20,000	21,750	21,500	22,000	20,000	22,500	25,000	7%	20%	34%
TOPIX	1,527	1,625	1,775	1,750	1,800	1,625	1,850	2,050	6%	21%	34%
ASX 200	5,239	5,200	5,200	5,250	5,400	5,200	5,500	6,000	-1%	5%	15%
HSCEI	10,283	11,000	12,500	12,500	13,500	11,000	14,000	16,000	7%	36%	56%
SHCOMP	3,317	3,500	3,750	3,600	3,800	3,500	4,000	4,500	6%	21%	36%
KOSPI	2,048	2,000	2,100	2,125	2,200	2,000	2,400	2,500	-2%	17%	22%
TAIEX	8,713	8,500	9,250	9,500	10,000	8,500	11,000	12,000	-2%	26%	38%
Sensex	26,591	28,000	31,500	32,000	34,000	28,000	35,000	40,000	5%	32%	50%

Source: SG Cross-Asset Research / Economics

SG GLOBAL 10Y YIELD FORECASTS

✓ **GOVT BOND YIELDS**: UST 10y bond yields to rise to 2.50% by Dec15 while Euro area yields are expected to be lower at 0.60%. First interest rate hike in the US now expected in December 2015 (from September 2015 before).

	Key rates						10Y							FX					
	Oct 21	2015	2016	2017	2018	2019	Oct 21	2015	2016	2017	2018	2019		Oct 21	2015	2016	2017	2018	2019
North America													**North America**						
US	0.1	0.1	0.7	1.9	3.1	3.1	2.0	2.1	2.4	3.2	3.9	3.9	**EURUSD**	1.14	1.11	1.07	1.07	1.16	1.22
Europe													**Europe**						
Euro area	0.1	0.1	0.1	0.1	0.2	1.0	0.6	0.5	0.7	1.6	2.6	3.0	**EURGBP**	0.73	0.73	0.71	0.71	0.75	0.77
UK	0.5	0.5	1.0	2.0	2.5	2.5	1.8	1.8	2.2	2.9	3.7	3.9	**GBPUSD**	1.55	1.53	1.50	1.51	1.54	1.57
Switzerland	-0.8	-0.6	-0.8	-0.7	-0.3	0.2	-0.3	-0.1	-0.2	0.8	1.8	1.9	**EURCHF**	1.09	1.08	1.12	1.16	1.18	1.20
Asia													**Asia**						
China	1.8	2.1	1.8	2.1	2.0	1.9	3.0	3.5	3.4	3.6	4.0	4.0	**USDCNY**	6.35	6.30	6.72	6.53	6.52	6.32
Japan	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.4	0.9	1.3	2.0	**USDJPY**	119.99	122	122	130	130	130
Australia	2.0	2.1	2.1	2.9	3.7	4.2	2.7	2.7	2.8	3.6	4.2	4.4	**AUDUSD**	0.72	0.75	0.68	0.70	0.74	0.77
South Korea	1.5	1.7	1.5	2.0	2.9	3.0	2.1	2.4	2.5	3.4	4.0	4.0	**USDKRW**	1132.38	1141	1168	1105	1075	1052
Latin America													**Latin America**						
Brazil	14.3	13.5	14.1	13.2	12.2	11.5	15.7	13.1	13.9	13.1	12.9	12.5	**USDBRL**	3.91	3.3	3.8	3.9	4.1	4.0
Mexico	3.0	3.0	4.1	5.0	5.0	4.5	5.9	6.0	6.3	6.5	6.3	6.1	**USDMXN**	16.64	15.7	16.0	15.1	14.5	14.2
Eastern Europe													**Eastern Europe**						
Russia	11.0	92.0	8.2	6.8	6.0	5.5	10.2	12.8	9.0	7.8	6.8	6.1	**USDRUB**	62.73	60	59	56	57	58

Source: SG Cross-Asset Research / Economics

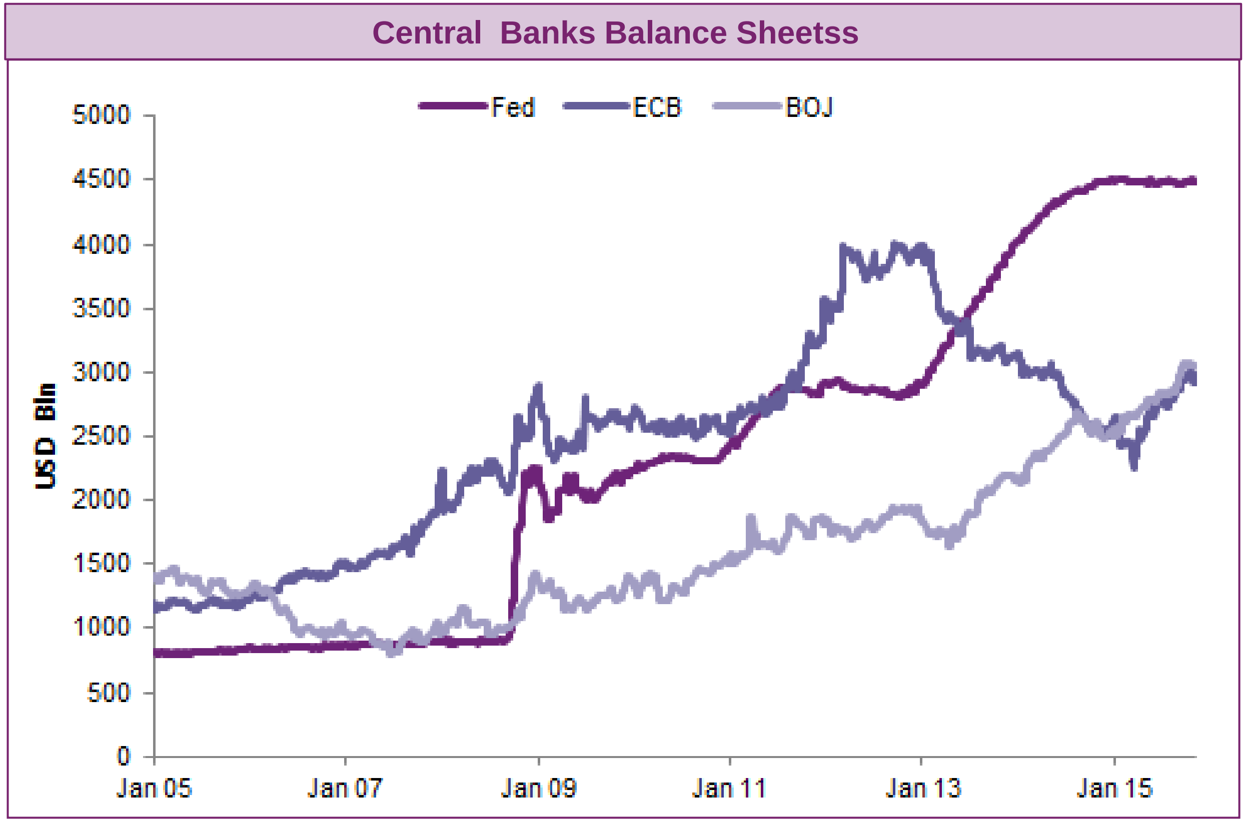
SG GLOBAL 10Y YIELD FORECASTS

✓ **GOVT BOND YIELDS**: UST 10y bond yields to rise to 2.50% by Dec15 while Euro area yields are expected to be lower at 0.60%. First interest rate hike in the US now expected in December 2015 (from September 2015 before).

	Real GDP							CPI						
	2013	2014	2015	2016	2017	2018	2019	2013	2014	2015	2016	2017	2018	2019
World (Mkt FX weights)	2.6	2.9	2.9	3.2	3.2	3.2	2.8	2.9	2.7	2.3	3.0	3.5	3.4	3.2
World (PPP weights)	3.3	3.4	3.2	3.6	3.8	3.8	3.6	4.1	3.6	3.8	4.2	4.3	4.1	3.9
Developed countries (PPI	1.1	1.8	2.0	2.3	2.1	2.2	1.5	1.4	1.4	0.3	1.4	2.4	2.3	2.1
Emerging countries (PPP	4.9	4.6	4.0	4.5	4.9	4.9	5.0	6.1	5.3	6.3	6.2	5.7	5.3	5.1
North America														
US	1.5	2.4	2.5	2.7	2.7	2.8	1.1	1.5	1.6	0.1	1.6	3.1	3.1	2.5
Europe														
Euro area	-0.2	0.9	1.5	1.5	1.5	1.4	1.3	1.4	0.4	0.1	1.0	1.5	1.4	1.5
Germany	0.4	1.6	1.5	1.6	1.5	1.3	1.3	1.6	0.8	0.2	1.2	1.6	1.6	1.5
France	0.7	0.2	1.2	1.4	1.5	1.3	1.2	1.0	0.6	0.2	1.1	1.6	1.4	1.4
Italy	-1.7	-0.4	0.8	1.2	0.9	0.9	0.8	1.3	0.2	0.2	1.1	1.7	1.4	1.4
Spain	-1.2	1.4	3.0	2.0	1.5	1.6	1.5	1.5	-0.2	-0.7	0.6	1.1	1.1	1.3
UK	1.7	3.0	2.5	2.0	1.7	1.6	1.5	2.6	1.5	0.1	1.3	2.1	2.2	2.1
Switzerland	1.8	1.9	1.0	1.3	1.7	1.8	1.8	-0.2	0.0	-1.1	0.0	0.5	0.7	0.7
Asia														
China	7.7	7.4	6.9	6.0	6.0	5.5	5.5	2.6	2.0	1.7	2.3	2.4	2.2	2.5
Japan	1.6	-0.1	0.8	2.2	1.1	1.4	1.4	0.4	2.7	0.9	1.2	2.9	2.4	2.1
Australia	2.1	2.7	2.4	2.8	3.2	3.0	2.9	2.4	2.5	1.7	2.4	2.8	2.8	3.0
South Korea	2.9	3.3	2.5	3.2	3.5	3.4	3.2	1.3	1.3	0.8	1.8	2.1	2.0	2.0
Latin America														
Brazil	2.7	0.2	-2.5	-0.7	0.9	1.2	1.5	6.2	6.3	8.8	6.6	5.8	5.5	5.3
Mexico	1.6	2.1	2.3	3.1	3.5	3.6	2.3	3.8	4.0	2.9	3.5	3.5	3.2	3.0
Russia & Eastern Europe														
Russia	1.3	0.6	-3.5	0.0	1.0	1.1	1.2	6.6	8.6	14.7	6.8	5.3	5.9	5.8

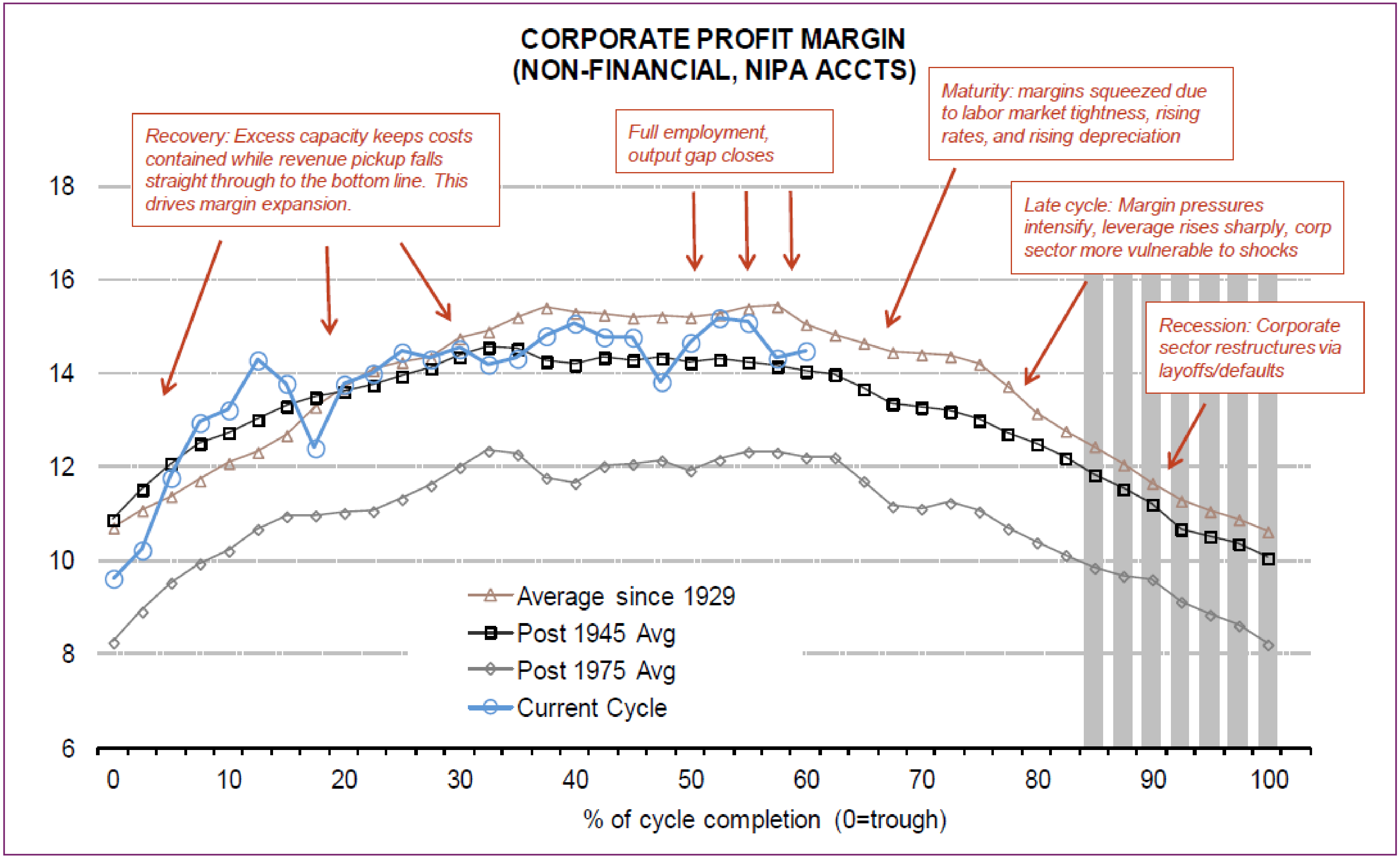
Source: SG Cross-Asset Research / Economics

CENTRAL BANKS ASSETS AND % GDP



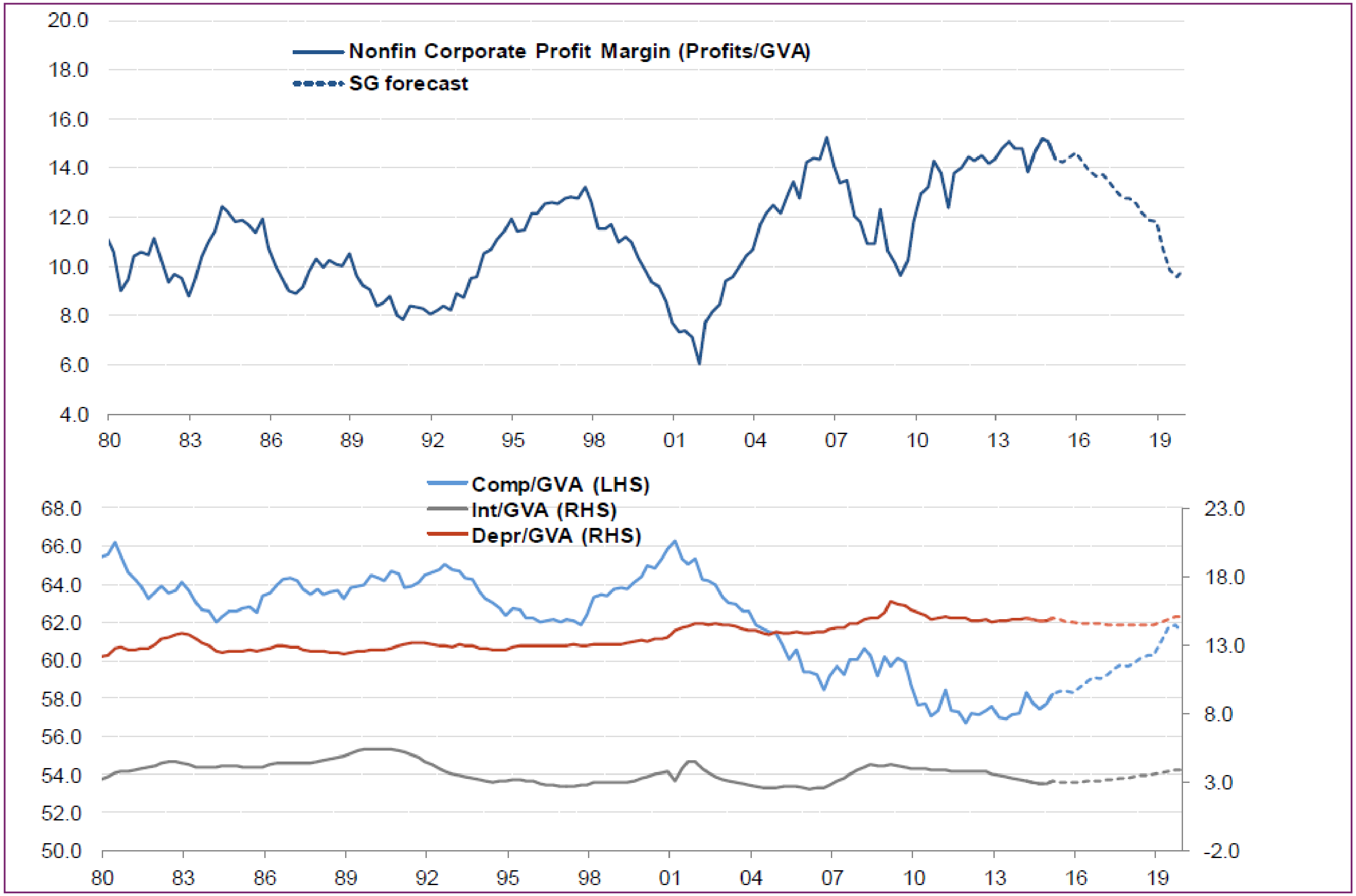
Source: SG CIB Flow Strategy & Solutions

US BUSINESS CYCLE MOVES FROM RECOVERY TO MATURITY



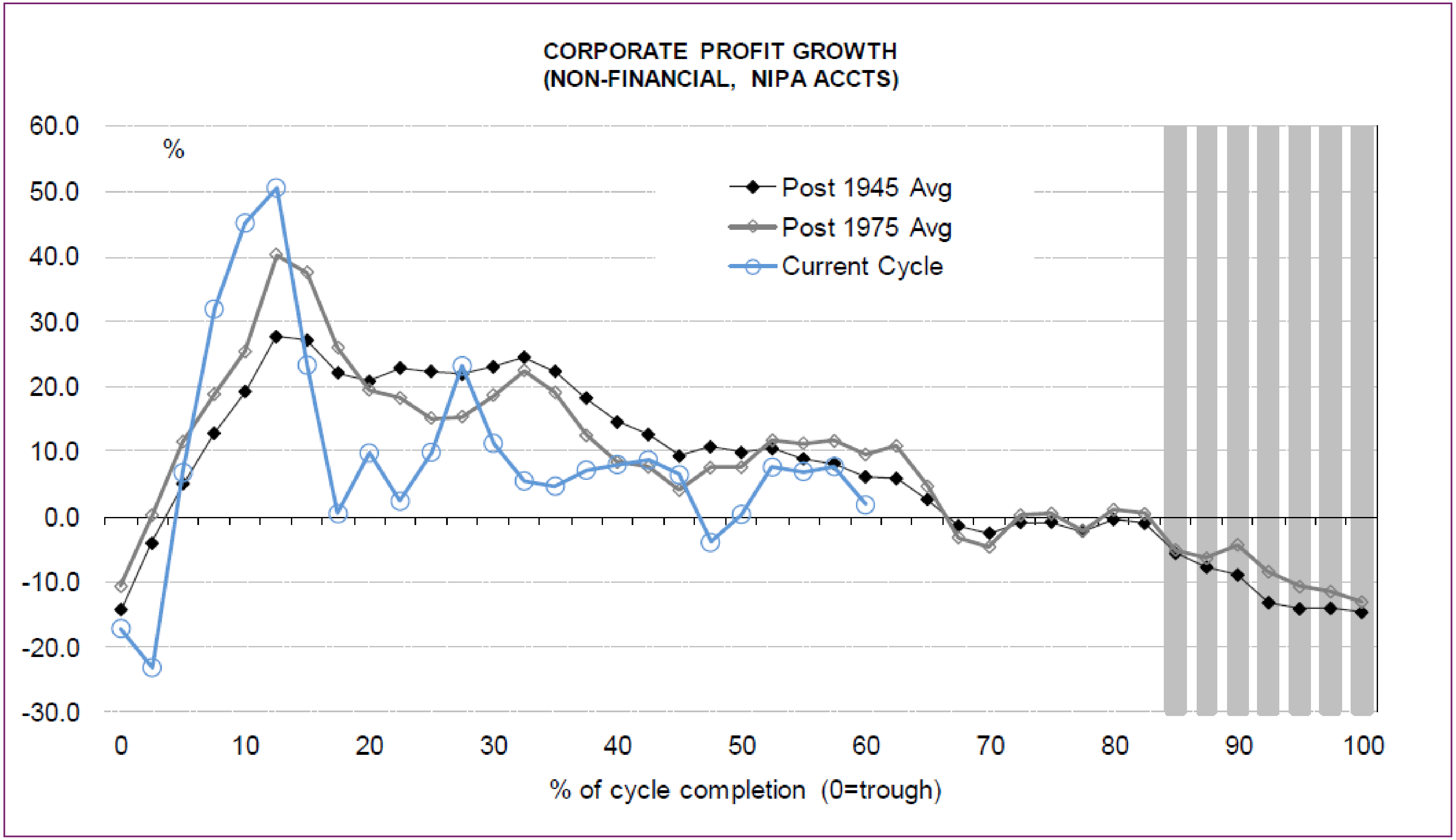
Source: SG Cross-Asset Research / Economics

MARGIN PRESSURES LIKELY TO MATERIALIZE NEXT YEAR



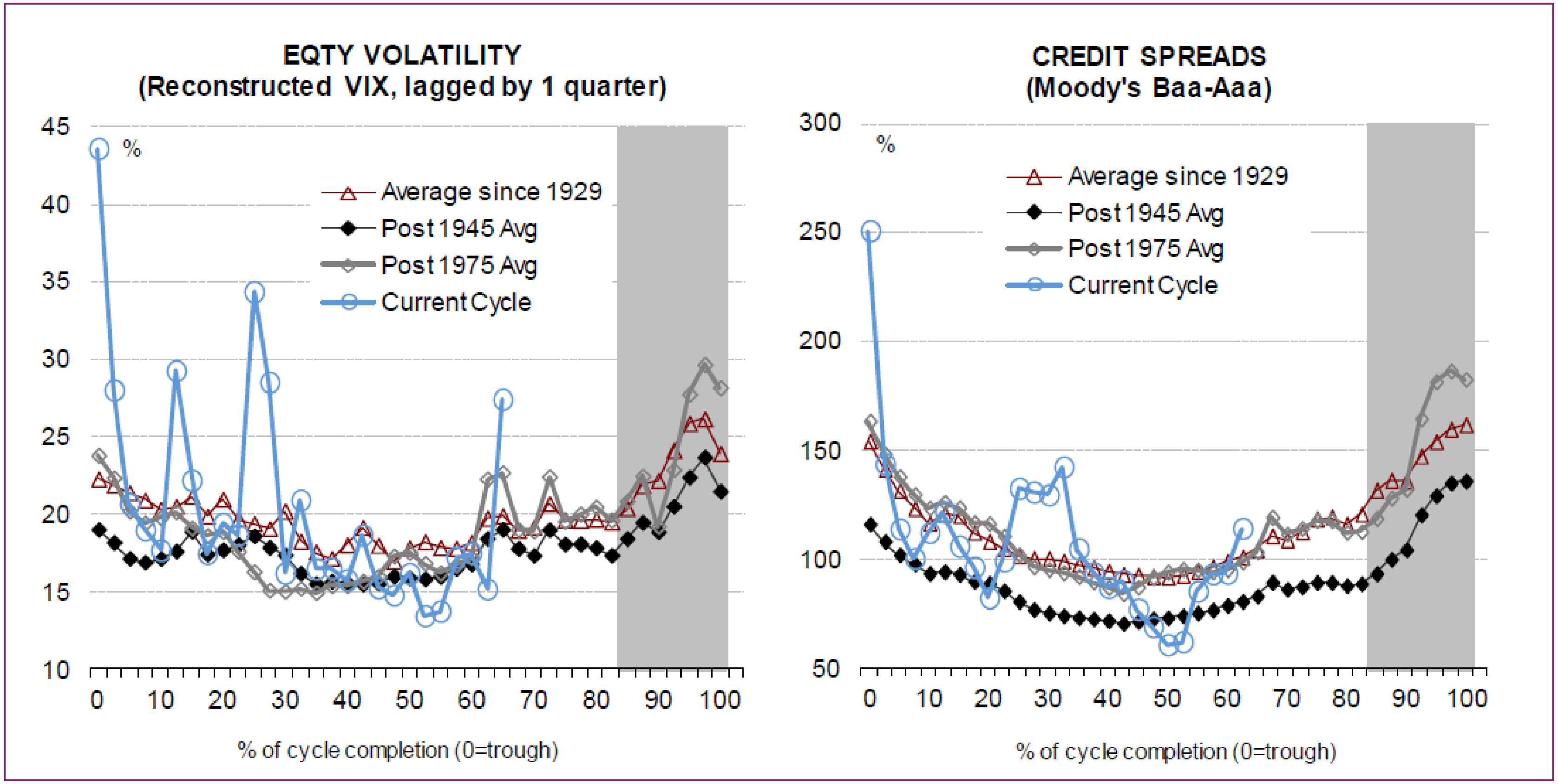
Source: SG Cross-Asset Research / Economics

PROFIT GROWTH TURNS NEGATIVE LONG BEFORE RECESSION



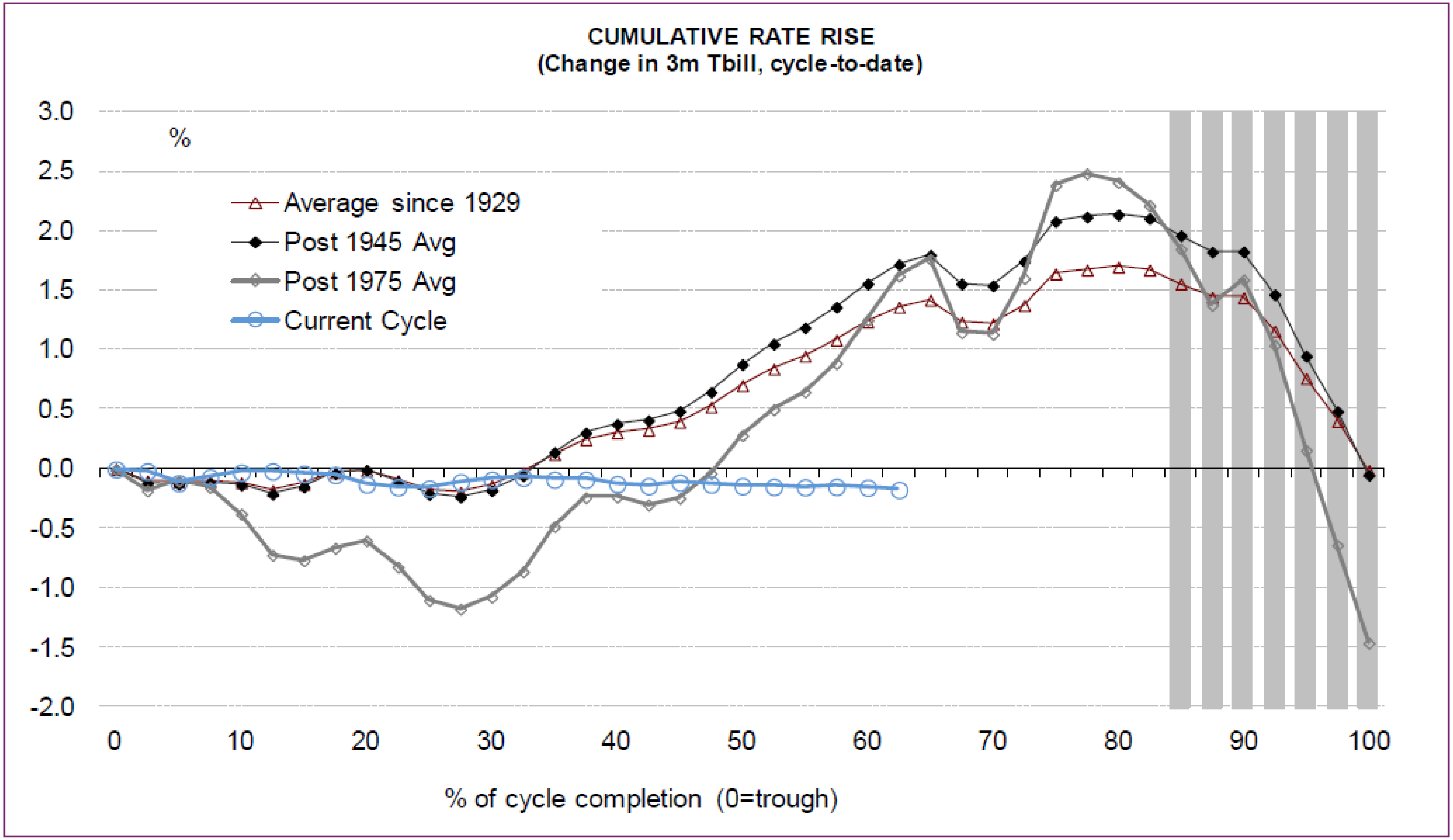
Source: SG Cross-Asset Research / Economics

US NOT AT THE END OF THE CYCLE JUST YET



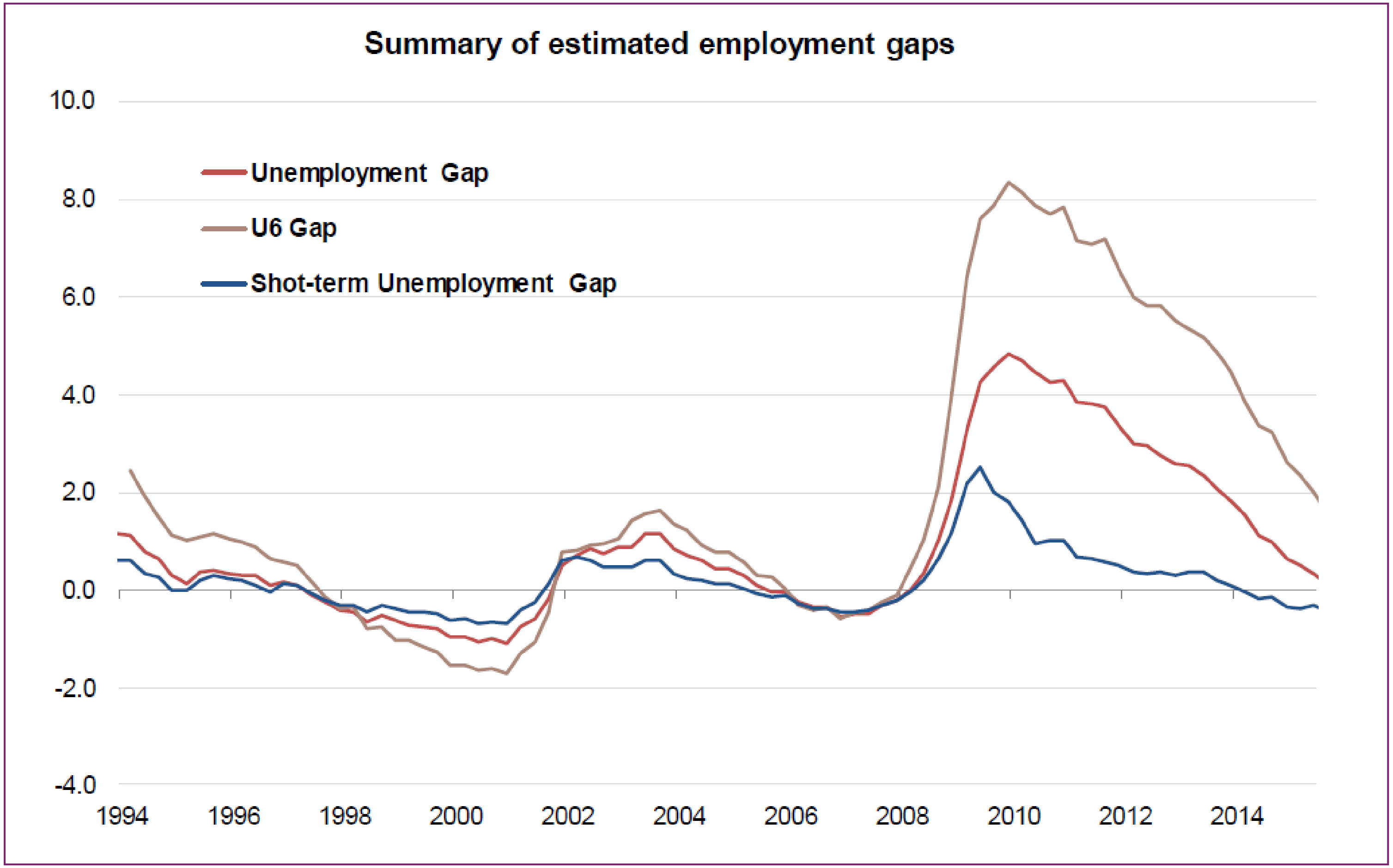
Source: SG Cross-Asset Research / Economics

BUT THE FED MAY HAVE OVERSTAYED ITS WELCOME



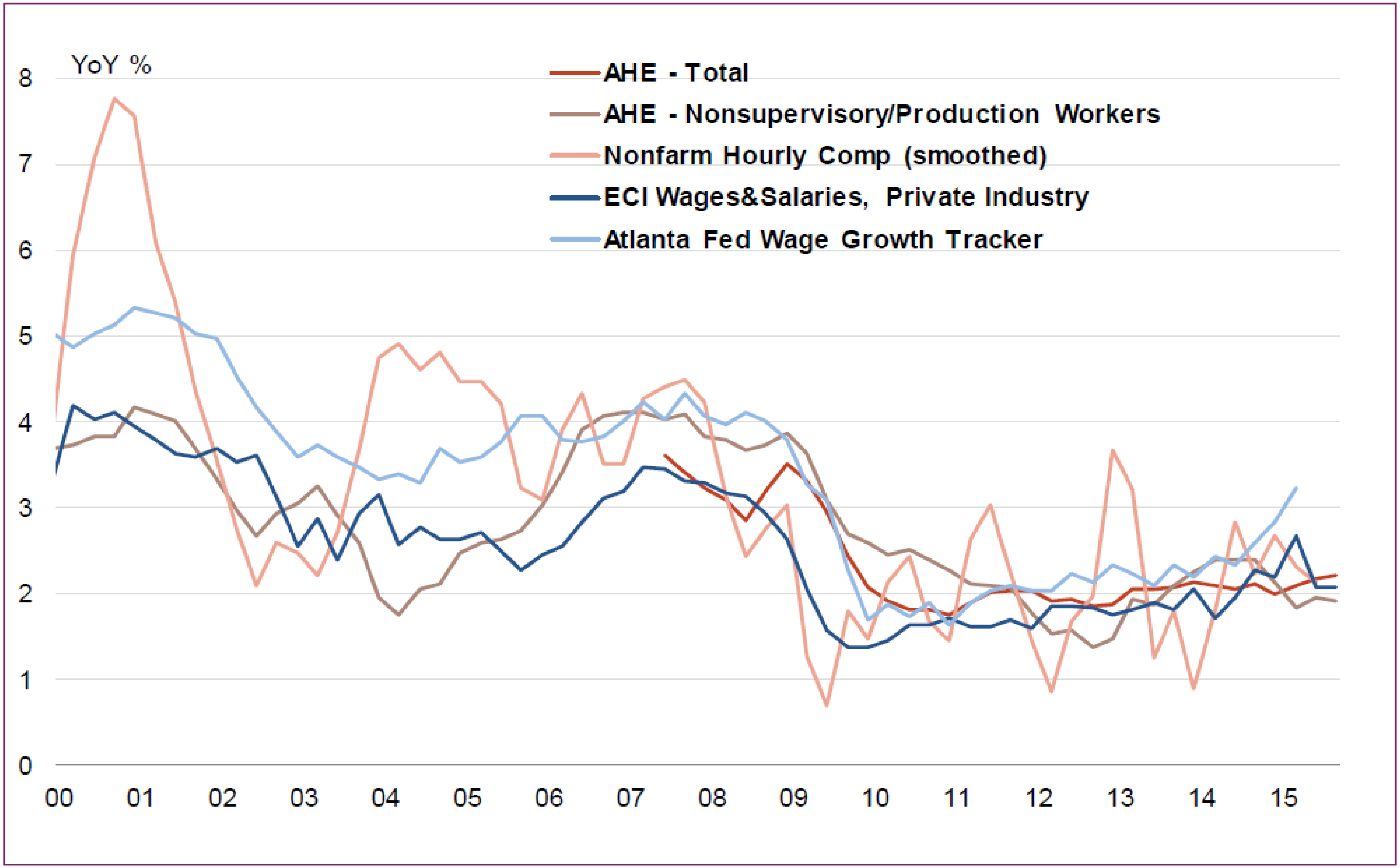
Source: SG Cross-Asset Research / Economics

LABOR MARKET IS APPROACHING "FULL STRENGTH"



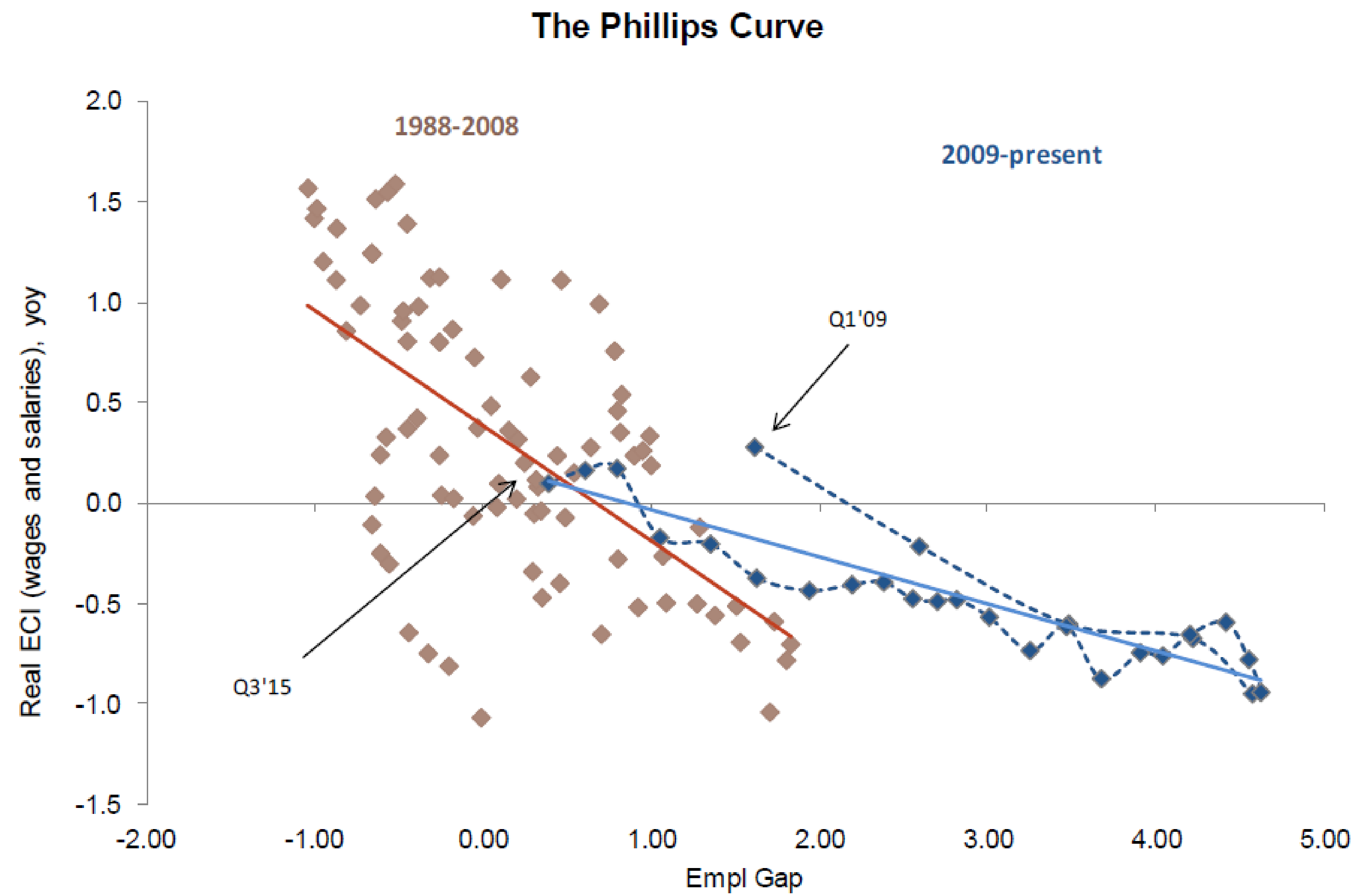
Source: SG Cross-Asset Research / Economics

NO PICKUP IN WAGE GROWTH YET



Source: SG Cross-Asset Research / Economics

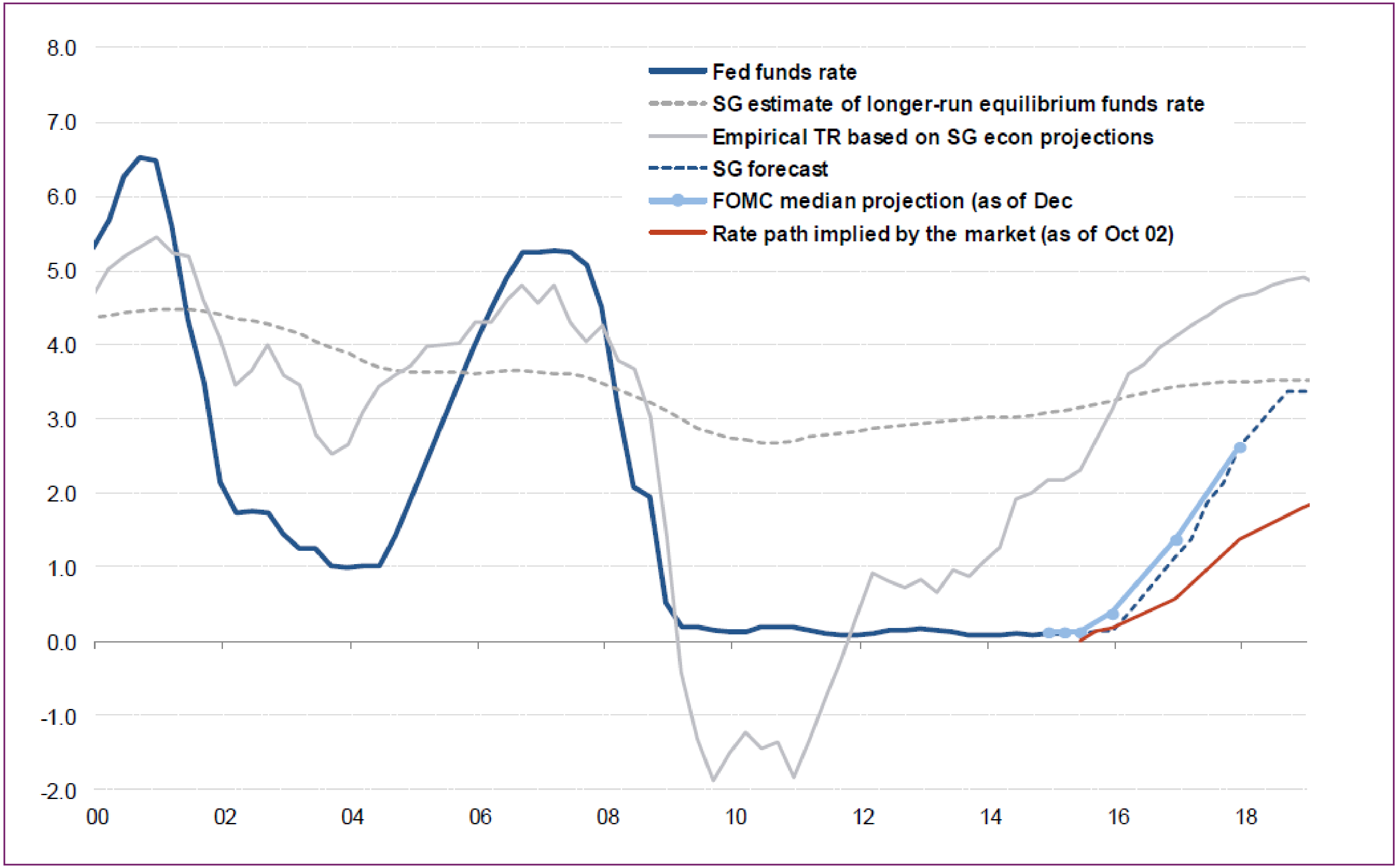
THE PHILLIPS CURVE WILL NOT STAY DORMANT FOR LONG



ECI data shown above is a four quarter moving average of the yoy growth rate

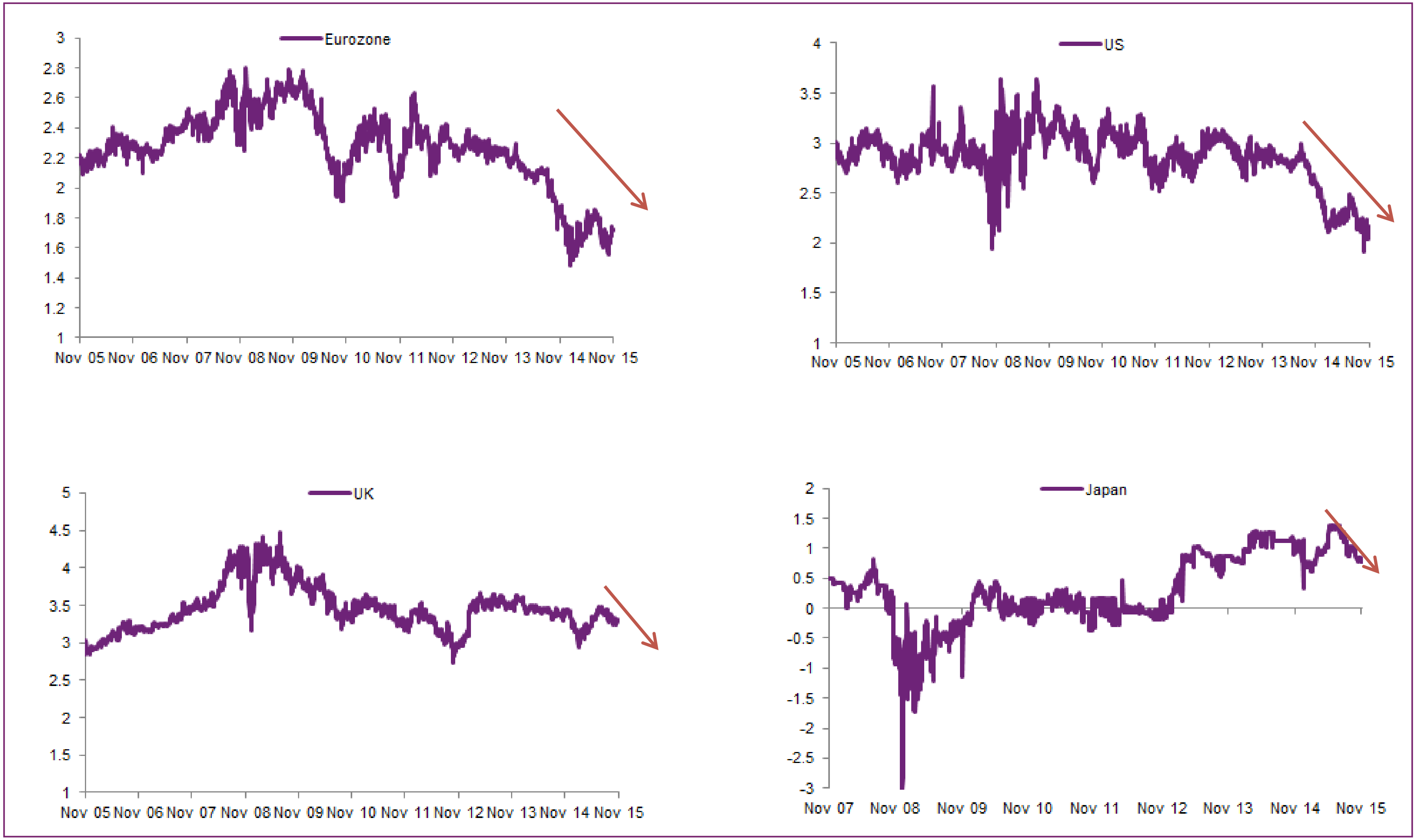
Source: SG Cross-Asset Research / Economics

MARKET CONTINUES TO CHALLENGE FED/ECONOMIST FORECASTS



Source: SG Cross-Asset Research / Economics

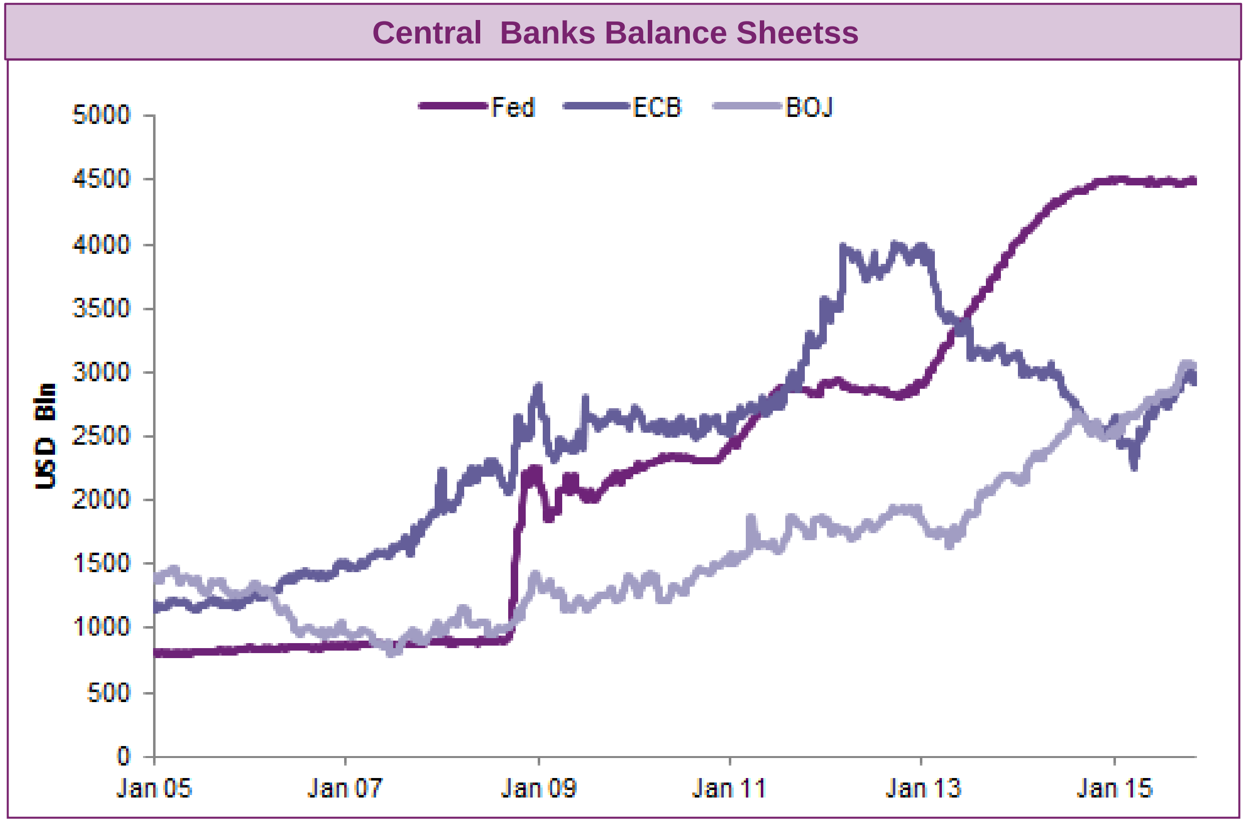
GLOBAL DISINFLATION – 5Y5Y FORWARD BREAKEVEN INFLATION



BUILDING TEAM SPIRIT TOGETHER

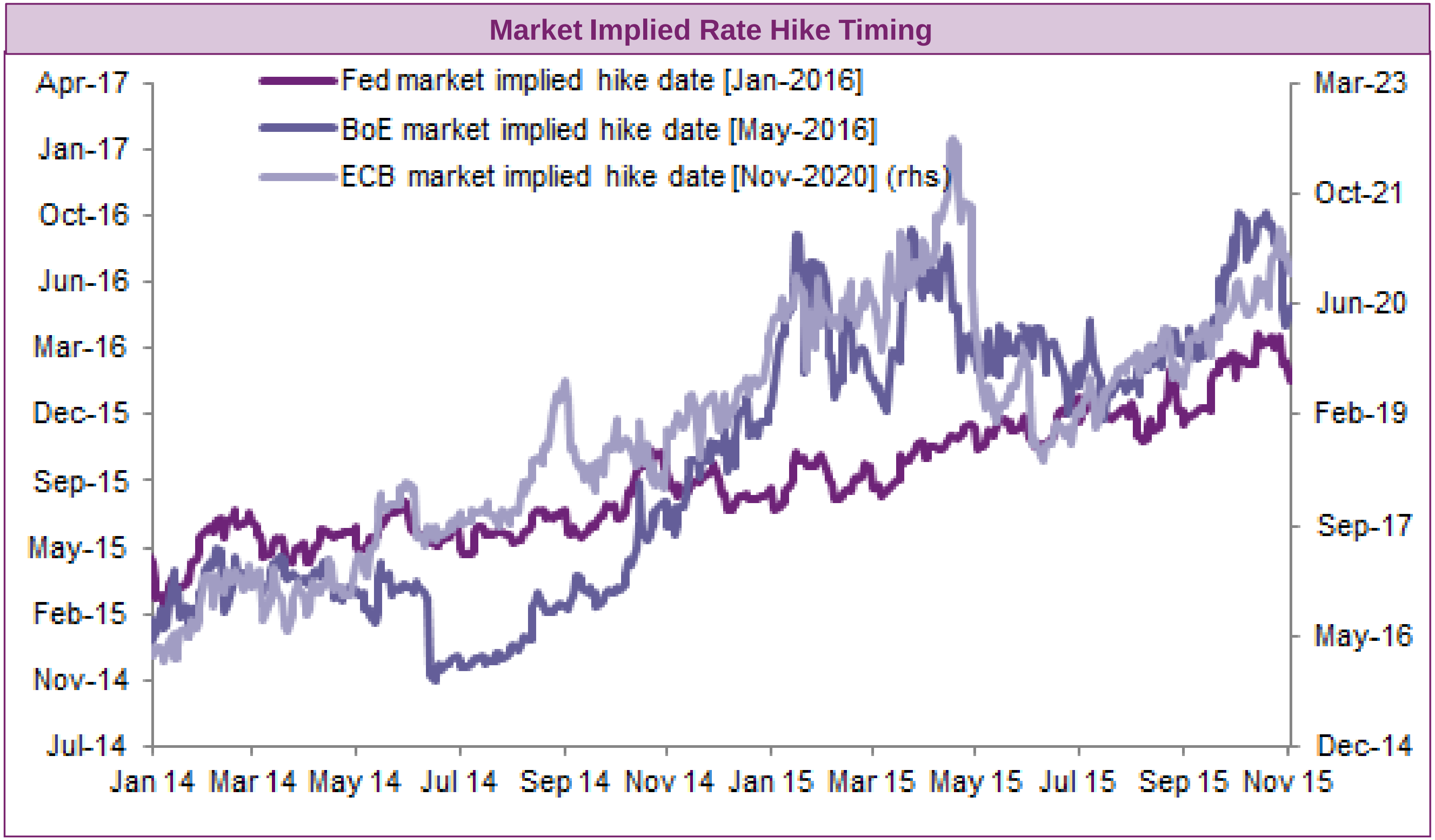
Source: SG CIB Flow Strategy & Solutions

CENTRAL BANKS ASSETS AND % GDP



Source: SG CIB Flow Strategy & Solutions

RATE HIKE ANTICIPATED BY THE MARKET



Source: SG Cross-Asset Research / Economics

WHERE ARE WE IN THE EQUITY / CREDIT CYCLE ?

Cycle/Time is passing by at a pace dictated by central banks' monetary policies

= Einstein's theory of relativity and **Space/Time continuum**

Deleveraging

Credit ↑ Equity ↓

Volatility ↓ Skew ↑

Vol of Vol ↑

Debt Crisis

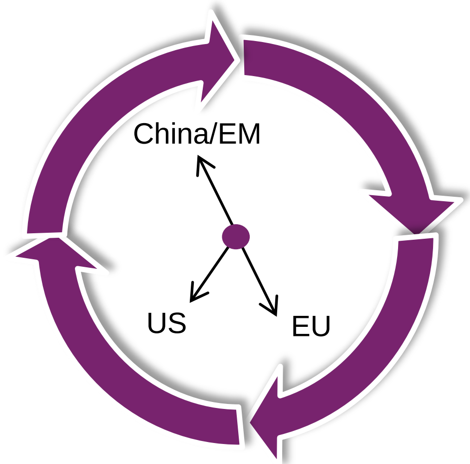
Credit ↓

Equity ↓

Volatility ↑

Skew ↑

Vol of Vol ↑



Co-Recovery

Credit ↑

Equity ↑

Volatility ↓

Skew ↓

Vol of Vol ↓

Re-leveraging

Credit ↓ Equity ↑

←Volatility→ ←Skew →

Vol of Vol ↑

Source: SG CIB Flow Strategy & Solutions

THE CASE FOR EUROPEAN BANKS. "LOW VOL IS BEAUTIFUL"

SX7E VALUATION

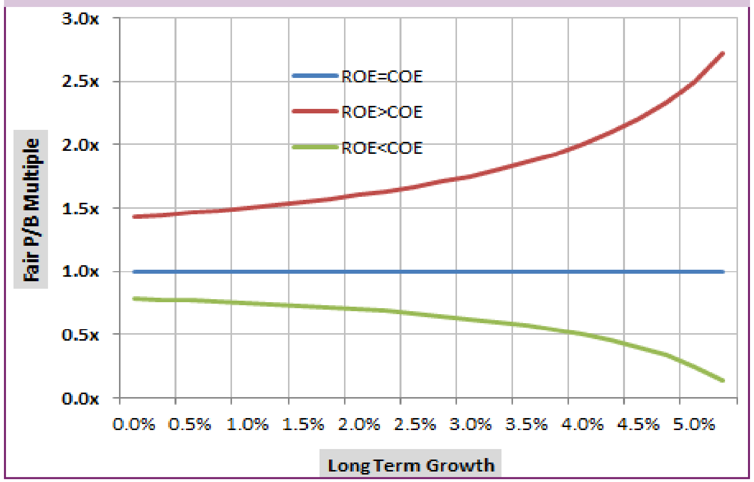
P/TE = [ROE - g]/[COE - g]
COE = Rf + beta x ERP

Terminal g =	1.5	
COE =	8.4	
Rf :	**1.6**	30y swap rates
ERP :	**4.5**	Europe current ERP
Beta :	**1.5**	Historical beta which should be lower going forward

	2015	2016
ROTE =	8.4%	8.9%
P/TE =	1.00	1.08
Current P/TE	0.96	0.90
% Return	5%	19%
Div Yield %	4.8%	5.8%
BPS %chg	2.5%	4.5%

Source: SG Research

Convexity of P/B multiple vs Growth



Source: SG CIB Flow Strategy and solutions

Key valuation relationship: P/B = (ROE – g)/(COE – g)

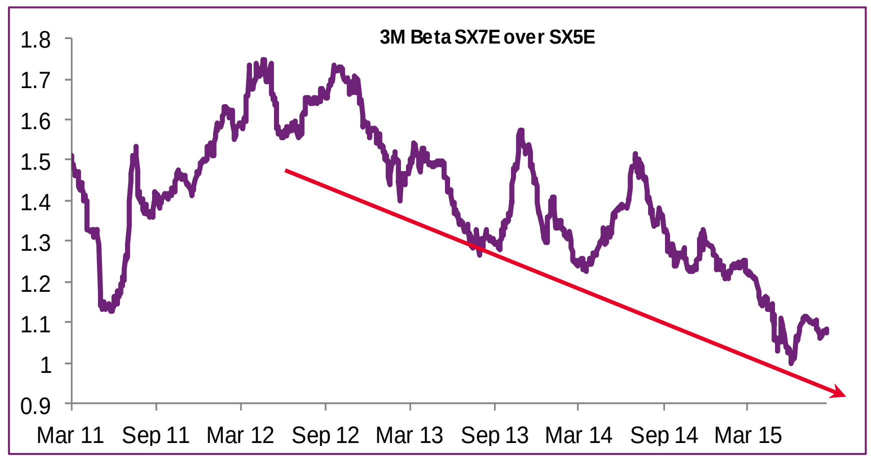
Deleveraging and more regulation not only drive ROE down but ROE volatility too, hence lower sector volatility.

This should therefore be reflected in lower COE via the beta as:
COE = rf + beta x ERP

Fair Price to Tangible Equity (P/TE) suggests 20% upside (ROE=9%, COE=8.4%, g=1.5%)

Balance sheet repair process well advanced, AQR, stress test, TLTROs completed. Liquidity conditions should improve. Much lower Senior Financials CDS spreads and European government bond yields should drive a re-rating of equity valuations from a capital structure perspective (Merton Model) and equity risk premium.

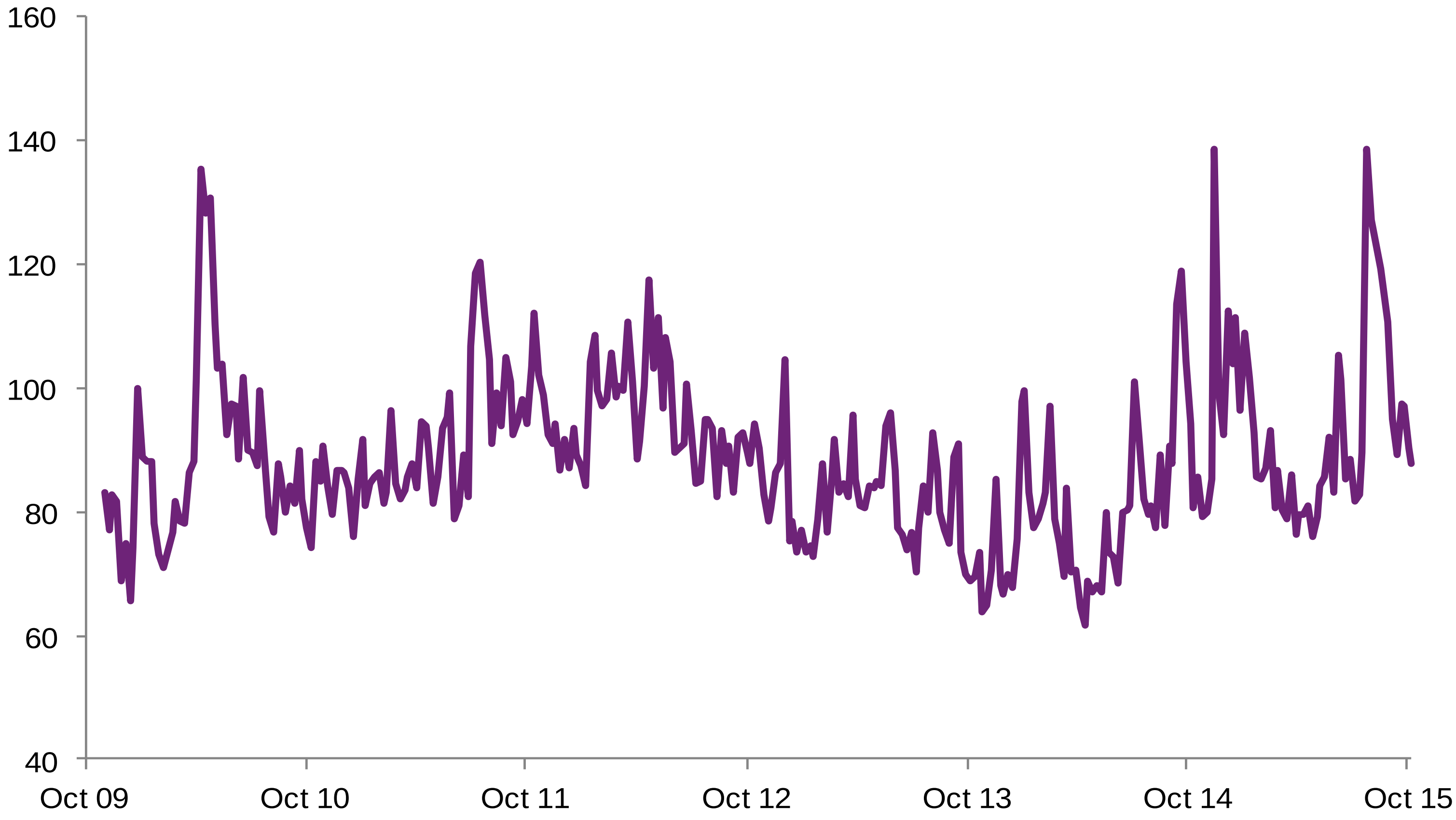
One should therefore observe higher ROE-COE spread for low vol equities, which in turn drives "P/B Convexity vs. Growth"



Source: SG Trading / SG CIB Flow Strategy and Solutions

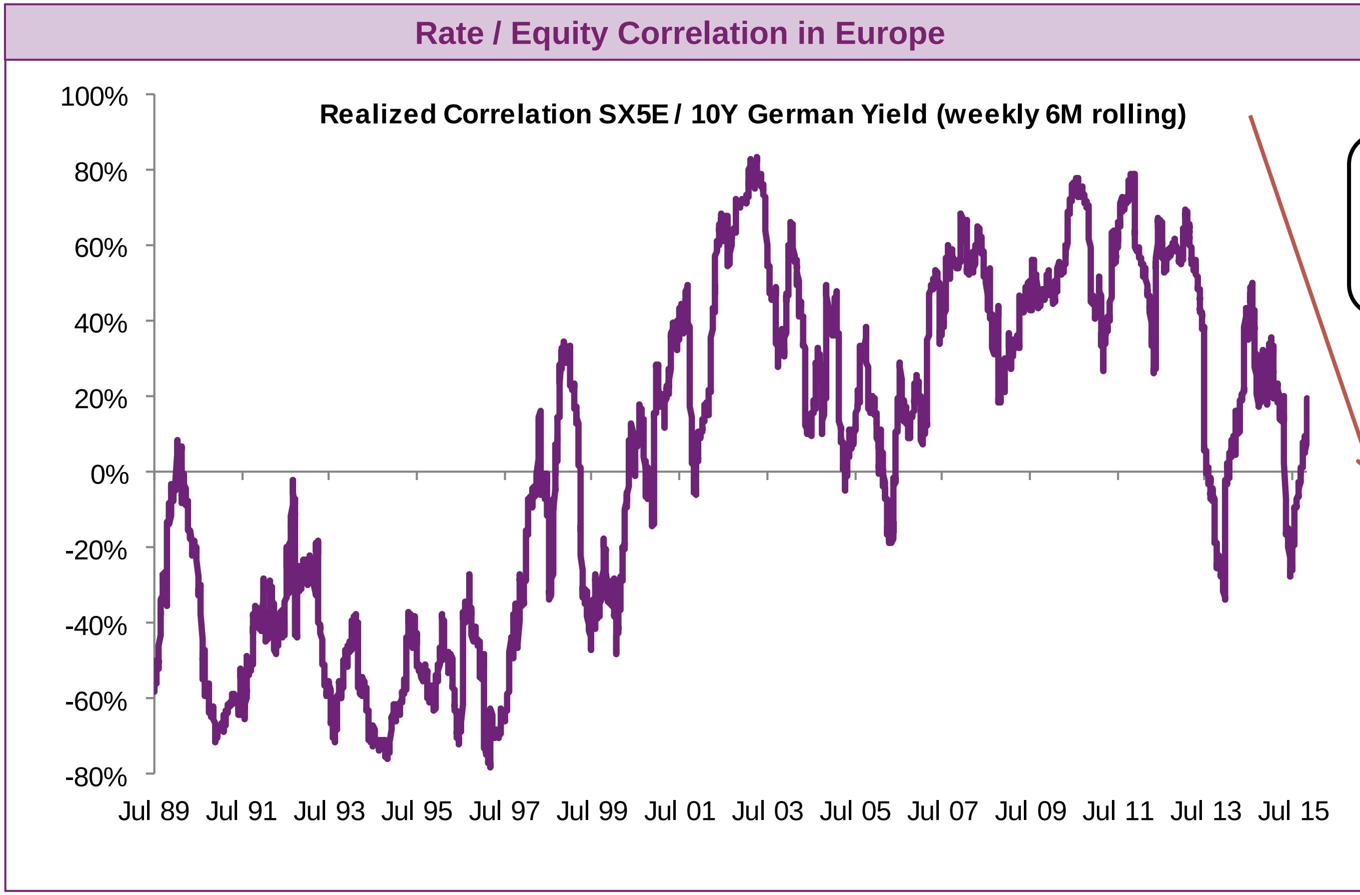
CONVEXITY RISK PREMIUM INCREASING – VOL IS MORE VOLATILE !

Volatility of VIX (Vol of Vol)



Source: SG Cross-Asset Research / Economics

CROSS-ASSET CORRELATION SHIFT



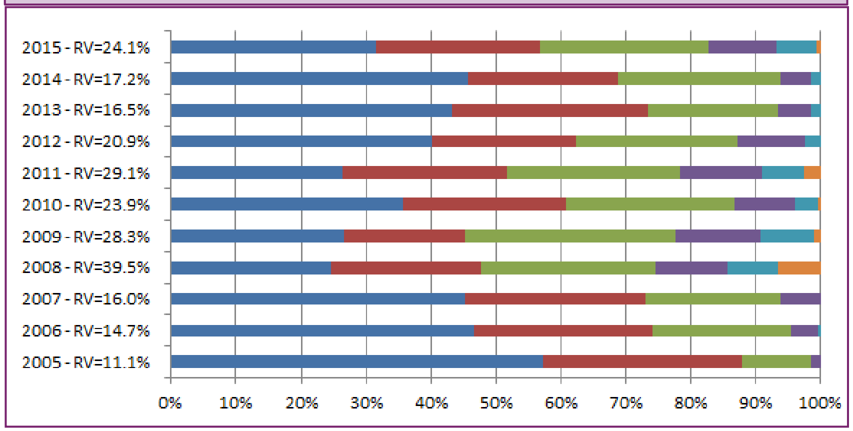
Multi-Asset Equity/Bond portfolio becomes more volatile

Source: SG Cross-Asset Research / Economics

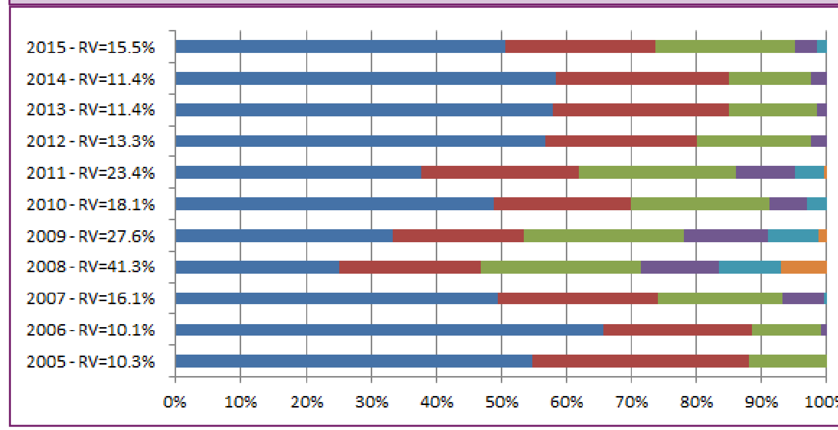
ANATOMY OF REALIZED VOLATILITY – FEWER ‘BORING’ DAYS

Move: 0.0%-0.5% 0.5%-1.0% 1.0%-2.0% 2.0%-3.0% 3.0%-5.0% 5.0%+

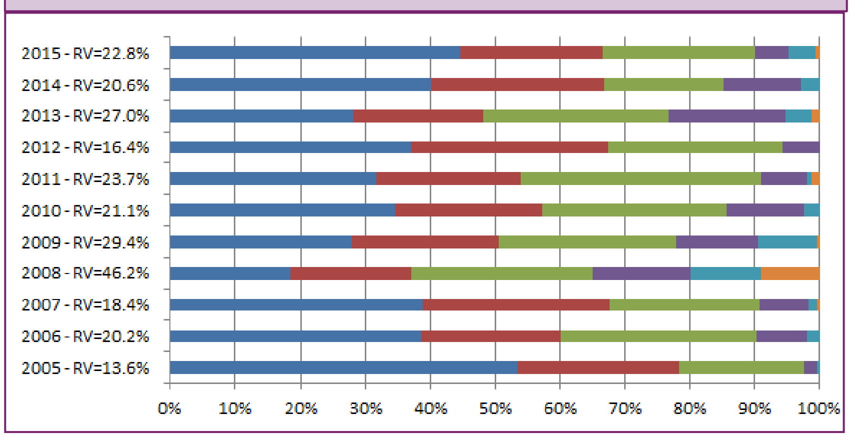
SX5E



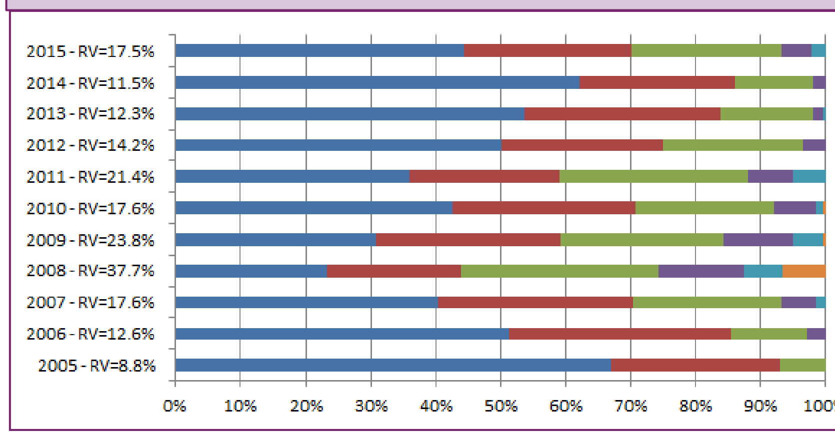
SPX



NKY



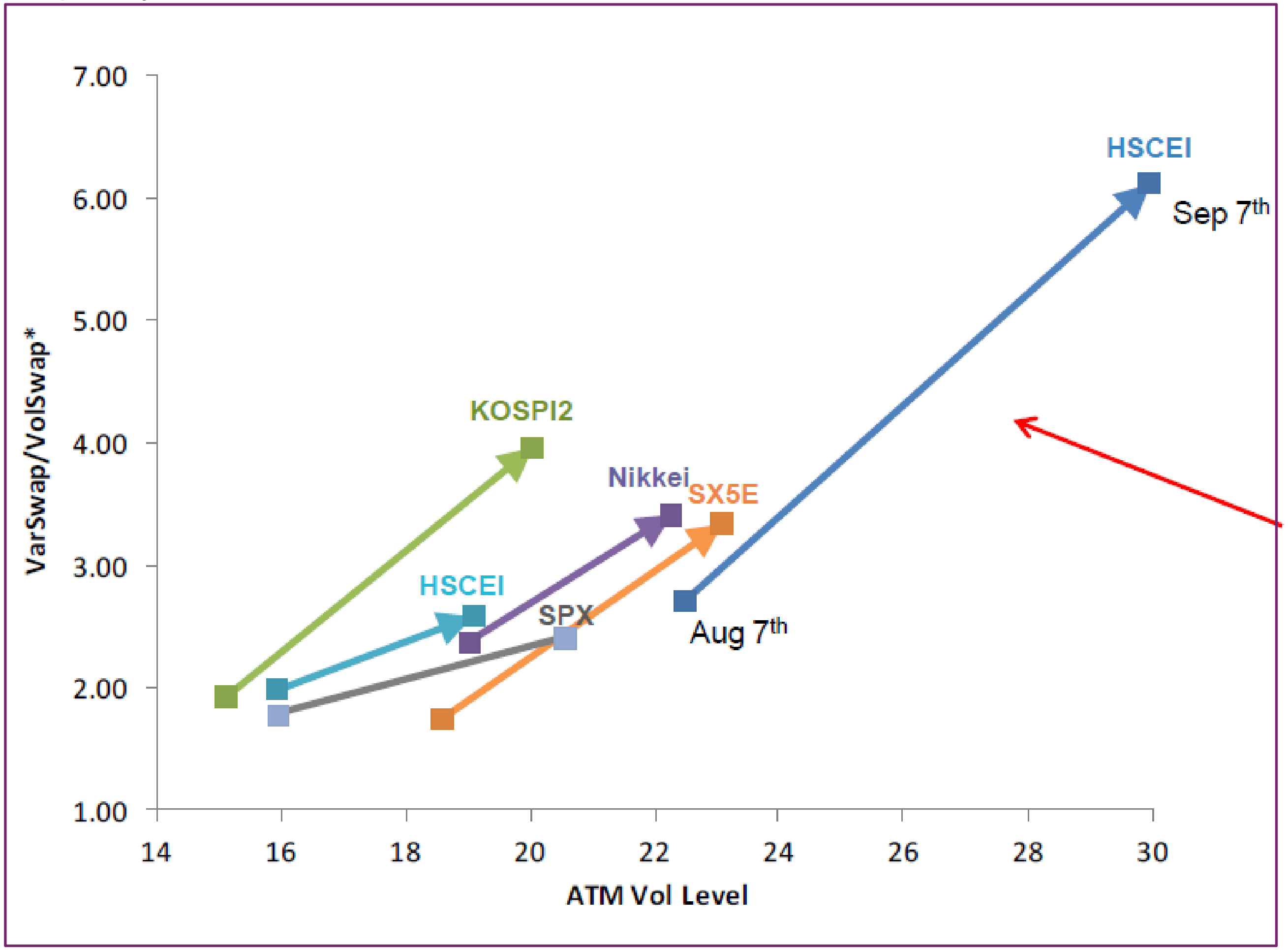
UKX



Source: SG CIB Flow Strategy & Solutions

HOW DISTRESSED DID HSCEI VOLS GET? CONVEXITY WAS THE BIG MOVER

Increased risk-aversion and changing structured products flow dynamics saw convexity get very bid increase across the board, but especially on the HSCEI…



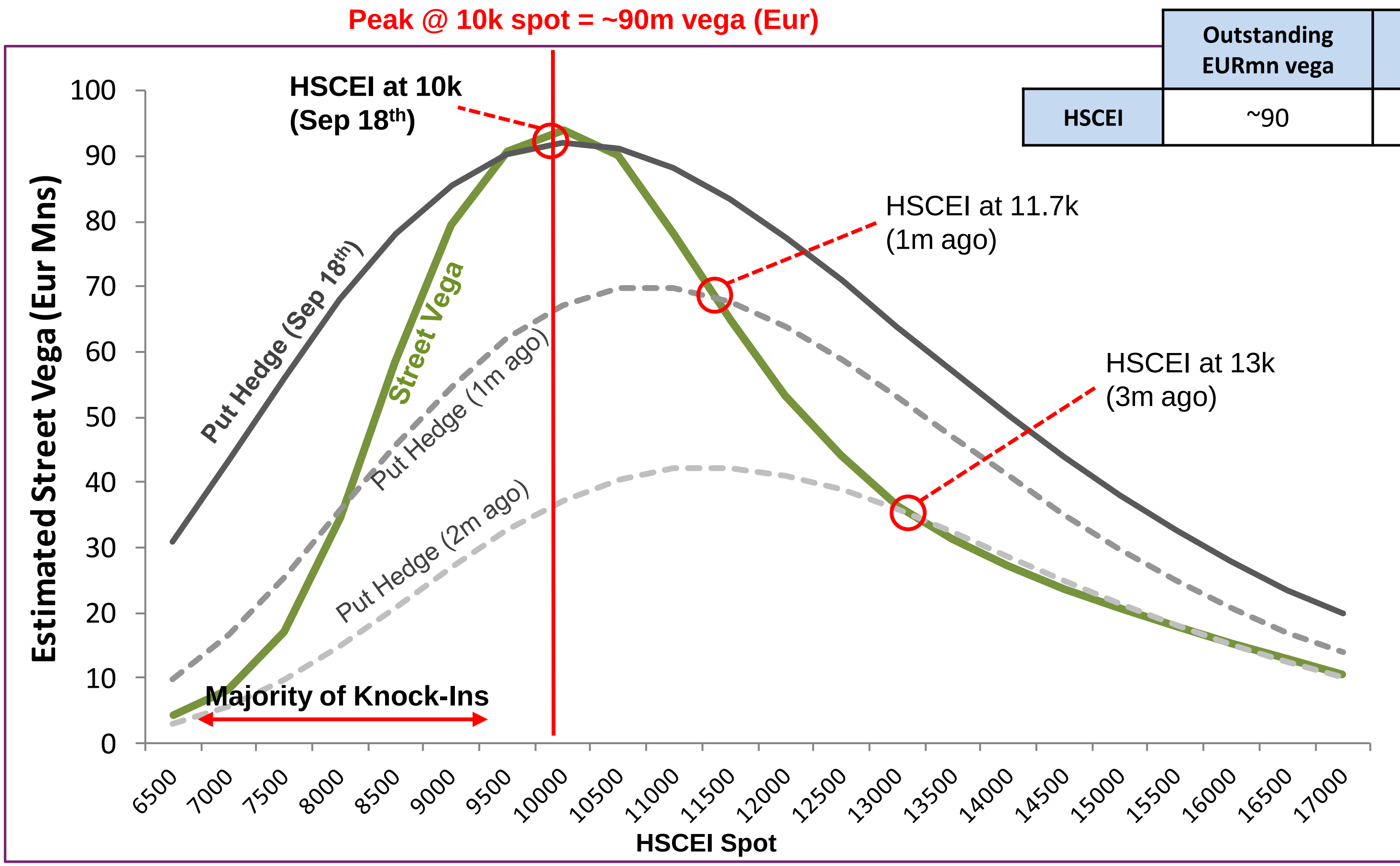
Increasing convexity resulted in VarSwap prices exploding as exotic desks selling pressure evaporated and flow became one-way from Hedge Funds

*Var/VolSwap calculated as half the Var/ATM Vol spread. Source: SG Flow Strategy & Solutions

STRUCTURED PRODUCTS WAGGING THE TAIL OF VOLATILITY SURFACE

***Chart:** Street exposure to **HSCEI** Vega from Autocalls and theoretical put hedge exposure*

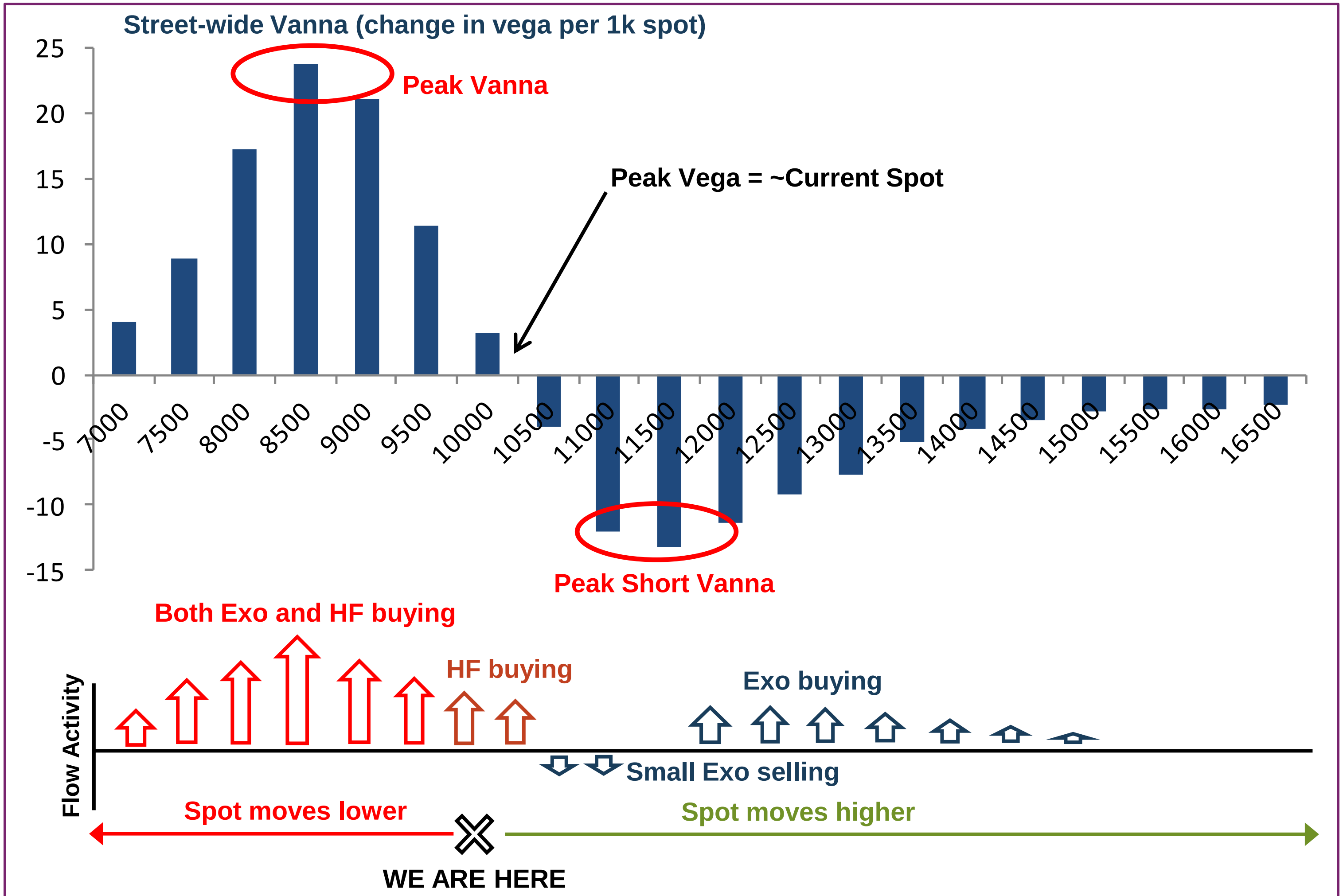
	Outstanding EURmn vega	dvega/dspot EURmn for 1% spot move
HSCEI	~90	0



Source: SG Flow Strategy & Solutions

IF SPOT MOVES ANY LOWER, EXO DESKS BECOME LARGE BUYERS

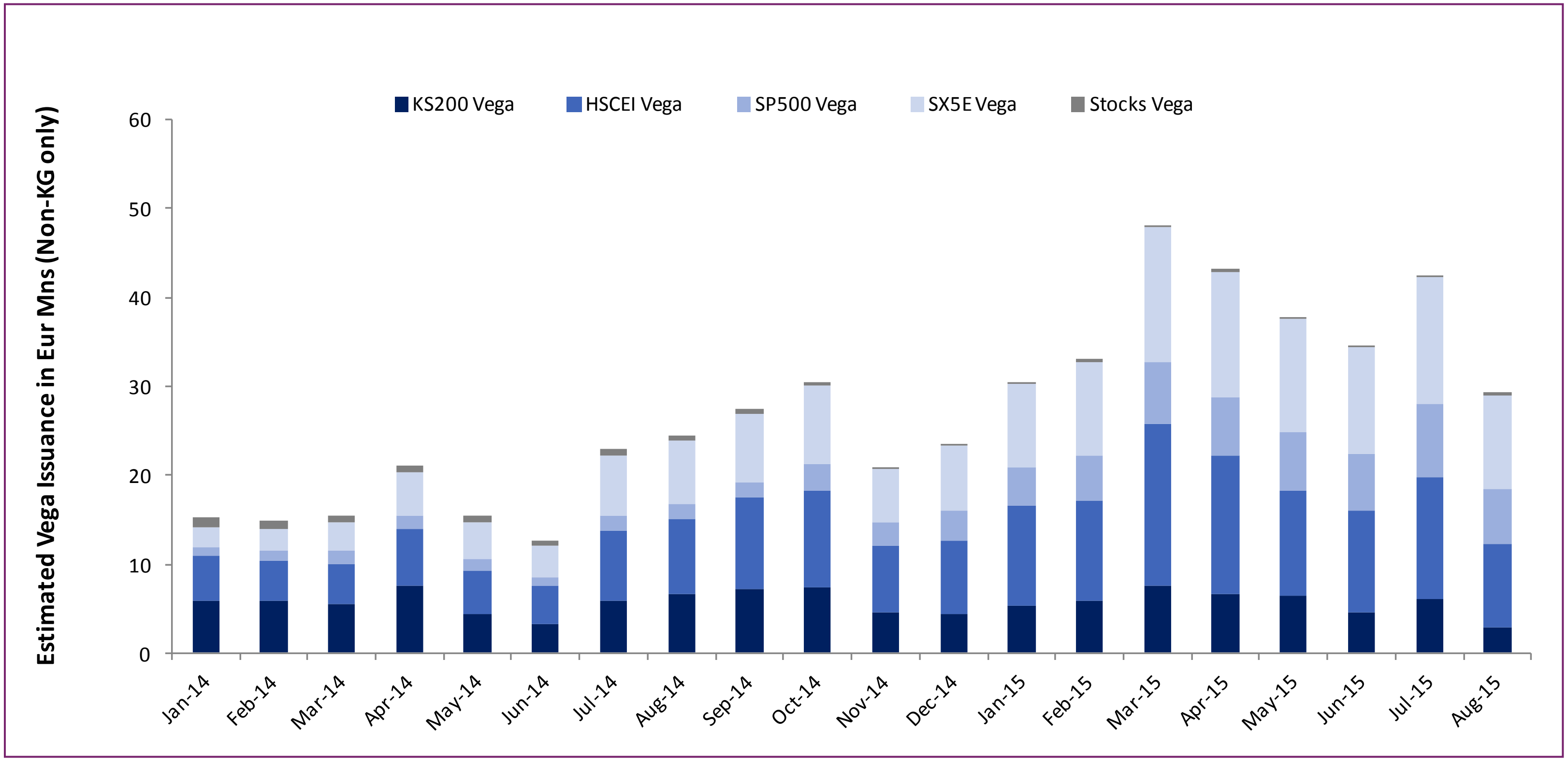
- Higher vanna causes higher skew:



Source: SG Flow Strategy & Solutions

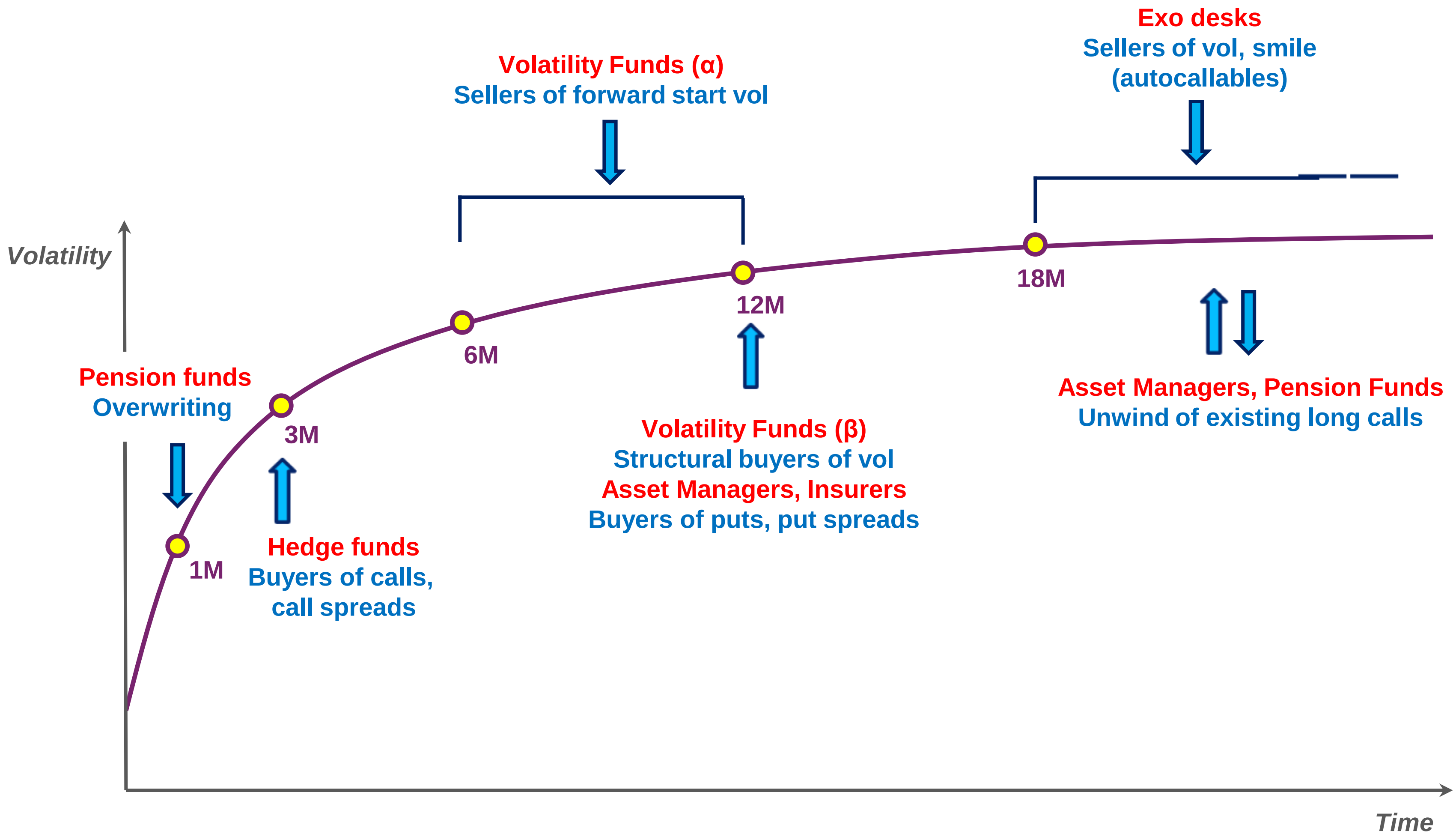
KOREAN STRUCTURED PRODUCTS ISSUANCE FALLEN OFF SIGNIFICANTLY

- Kospi2 has actually been one of the least popular indices in recent months.
- If HSCEI spot remains at these levels, issuance is likely to be lower in coming months as fewer products knock-out.



Source: SG Flow Strategy & Solutions

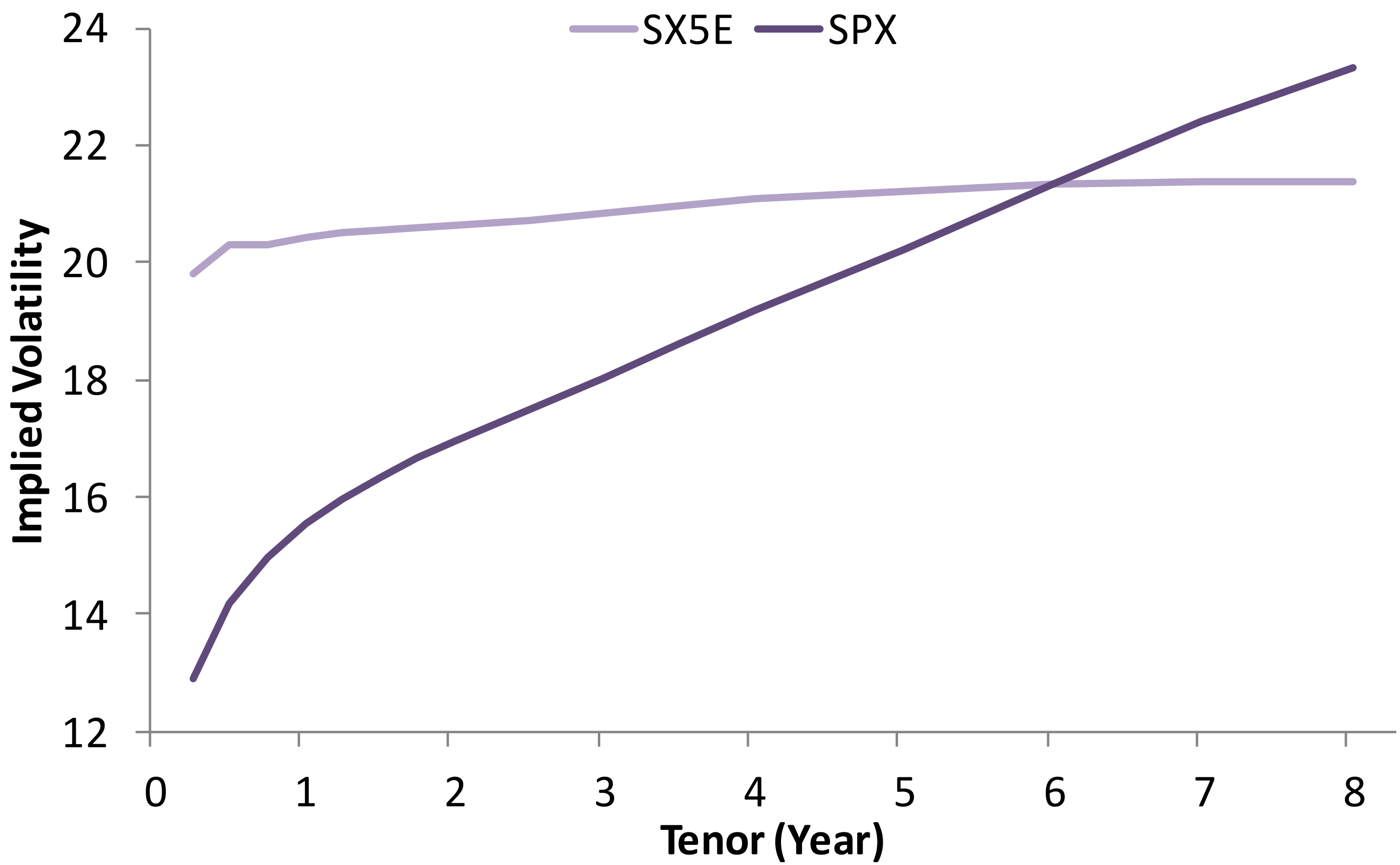
EUROSTOXX VOLATILITY TERM STRUCTURE – PLAYERS' PRESSURE POINTS



Source: SG CIB Trading

VOLATILITY TERM STRUCTURE DIVERGENCE

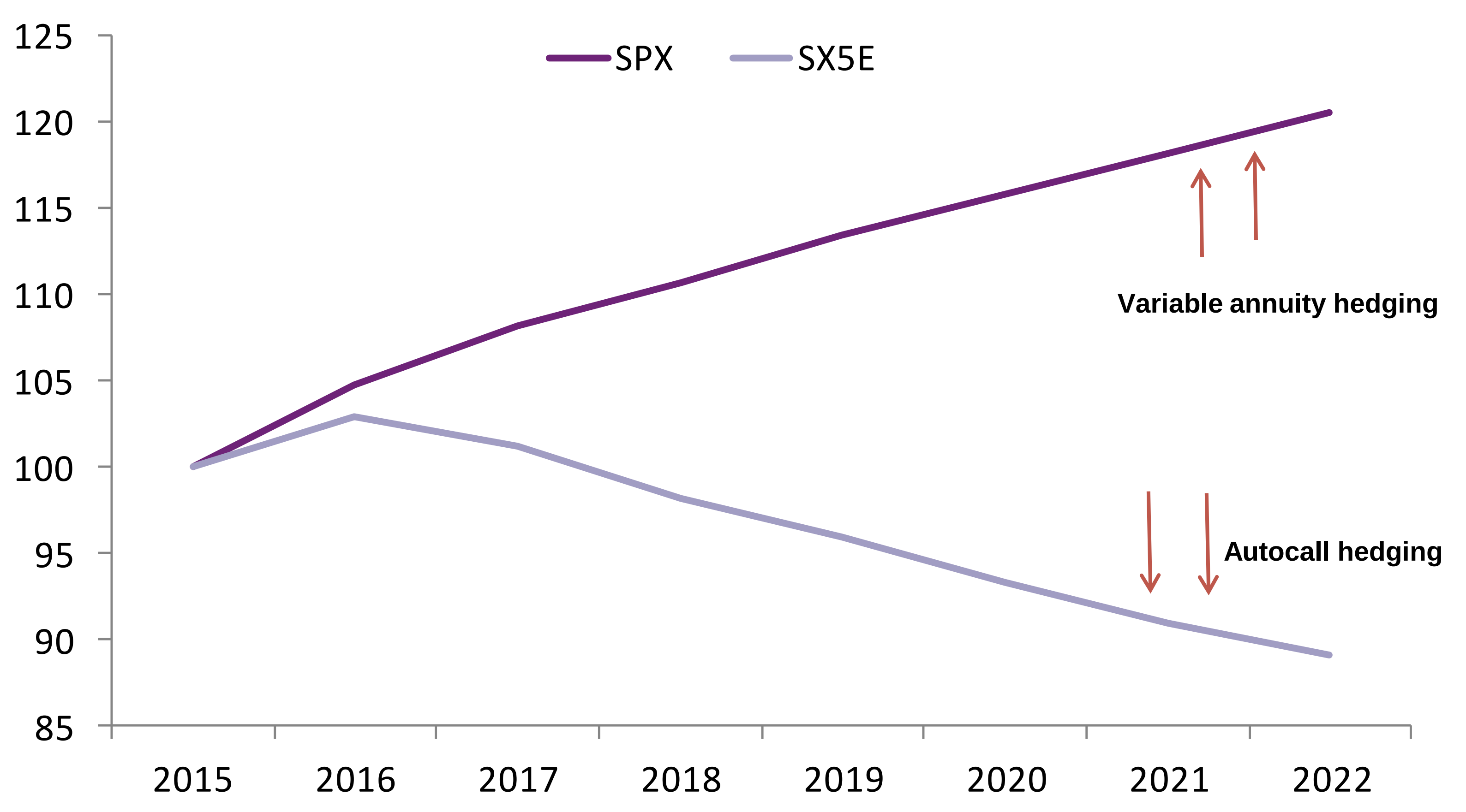
Volatility Term Structures



Source: SG CIB Flow Strategy & Solutions

IMPLIED DIVIDENDS TERM STRUCTURE

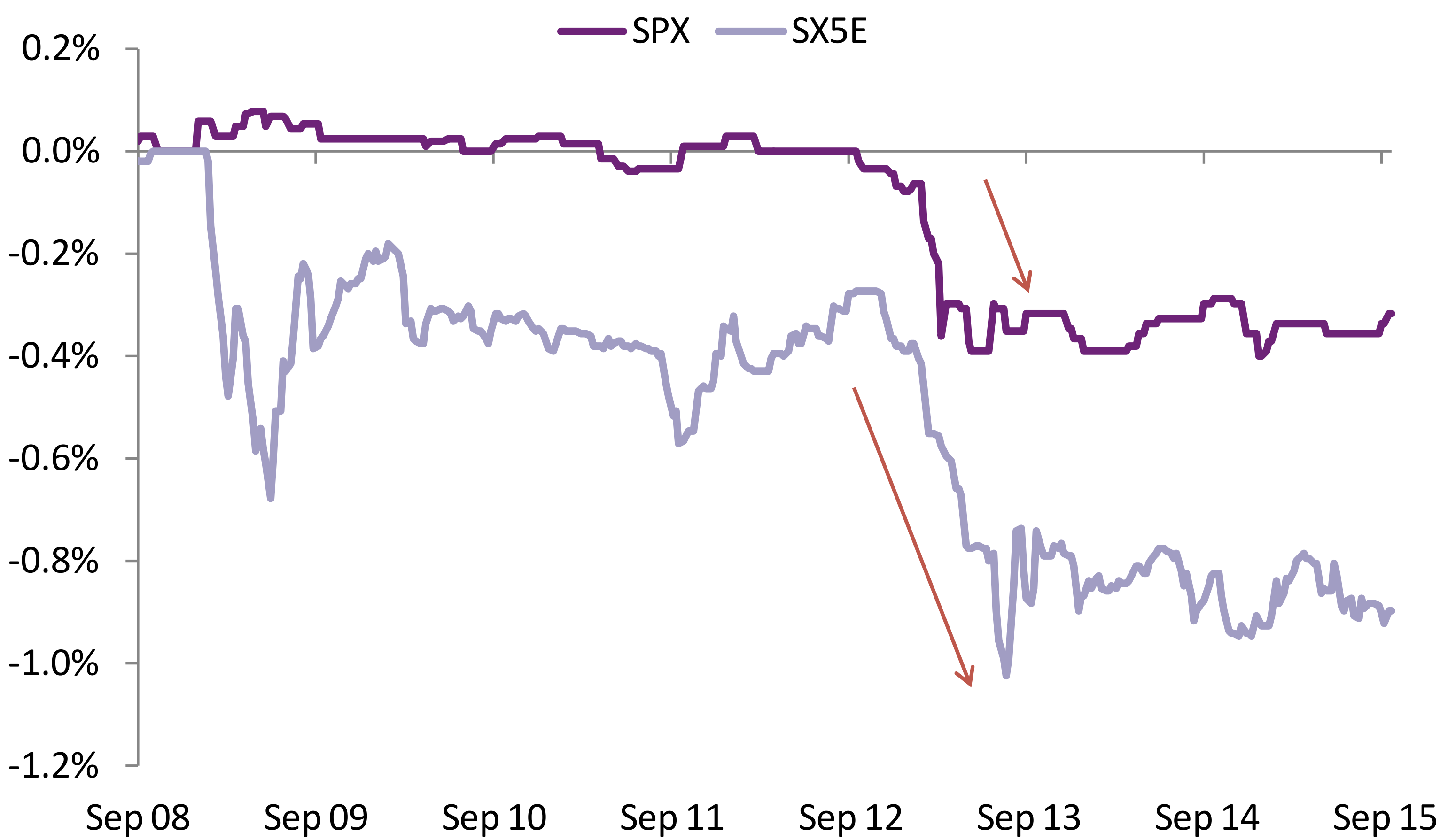
Dividend Term Structures



Source: SG CIB Flow Strategy & Solutions, Bloomberg

REPO = BANKS DIS-INTERMEDIATION

Implied 5Y Repo rate



Source: SG CIB Flow Strategy & Solutions, Bloomberg

VOLATILITY - SX5E VS. SPX FORWARD VARIANCE SWAPS HEATMAP

Implementation: Buy 12m forward 6m SX5E vs SPX variance swap spread, @ ~3.2. (ie 20th %-ile and rolldown at 80th %-ile)

SX5E Var	1m	3m	6m	12m	18m	24m
Current	31.9	29.5	28.8	27.64	27.0	26.7
1m Fwd Start	28.37	28.34	27.99	27.14	26.62	26.44
3m Fwd Start	28.51	28.04	27.47	26.73	26.35	26.31
6m Fwd Start	27.28	26.88	26.45	26.02	25.94	26.13
9m Fwd Start	26.42	26.02	25.96	25.78	25.91	26.11
12m Fwd Start	26.16	25.91	25.58	25.68	26.03	26.20
24m Fwd Start	26.70	26.70	26.70	26.71	26.75	26.78

SX5E vs SPX Var	1m	3m	6m	12m	18m	24m
Current	10.7	7.8	6.5	5.1	4.4	4.1
1m Fwd Start	7.12	6.46	5.74	4.79	4.24	4.08
3m Fwd Start	6.32	5.50	4.93	4.26	3.92	3.88
6m Fwd Start	4.87	4.35	4.00	3.56	3.55	3.69
9m Fwd Start	4.08	3.65	3.57	3.39	3.51	3.65
12m Fwd Start	3.77	3.49	3.12	3.32	3.59	3.68
24m Fwd Start	4.14	4.12	4.09	4.03	3.67	3.38

Spread Rolldown Annualized

SX5E vs SPX	1m	3m	6m	12m	18m	24m
1m Fwd Start	43.42	15.83	9.05	3.96	1.53	0.09
3m Fwd Start	17.68	9.14	6.24	3.44	1.82	0.85
6m Fwd Start	11.73	6.86	4.97	3.11	1.63	0.80
9m Fwd Start	8.88	5.51	3.89	2.31	1.14	0.59
12m Fwd Start	6.97	4.29	3.37	1.80	0.78	0.41
24m Fwd Start	3.30	1.83	1.20	0.54	0.35	0.35

SPX Var	1m	3m	6m	12m	18m	24m
Current	22.1	22.7	23.3	23.5	23.6	23.6
1m Fwd Start	22.55	23.18	23.55	23.65	23.68	23.66
3m Fwd Start	23.49	23.85	23.84	23.77	23.74	23.73
6m Fwd Start	23.71	23.83	23.75	23.75	23.69	23.74
9m Fwd Start	23.63	23.67	23.69	23.69	23.70	23.77
12m Fwd Start	23.69	23.72	23.76	23.66	23.74	23.82
24m Fwd Start	23.86	23.88	23.91	23.98	24.38	24.70

SX5E vs SPX 5Y %tile	1m	3m	6m	12m	18m	24m
Current	5.4%	9.9%	12.7%	15.9%	23.0%	20.8%
1m Fwd Start	71%	72%	69%	60%	48%	51%
3m Fwd Start	**78%**	69%	61%	46%	40%	48%
6m Fwd Start	61%	51%	42%	29%	36%	49%
9m Fwd Start	61%	32%	25%	28%	41%	56%
12m Fwd Start	53%	22%	19%	34%	52%	63%
24m Fwd Start	64%	70%	73%	80%	75%	73%

5Y%ile Rolldown

SX5E vs SPX	1m	3m	6m	12m	18m	24m
1m Fwd Start	71.5%	36.9%	26.2%	13.6%	17.6%	29.0%
3m Fwd Start	70.2%	46.7%	51.0%	31.5%	37.7%	36.9%
6m Fwd Start	85.4%	73.7%	60.8%	58.5%	52.7%	48.0%
9m Fwd Start	79.6%	65.6%	63.1%	68.3%	52.0%	46.1%
12m Fwd Start	83.1%	75.7%	79.8%	72.7%	55.6%	53.0%
24m Fwd Start	86.7%	73.0%	66.6%	53.6%	54.6%	53.8%

Source: SG CIB Flow Strategy & Solutions

VALUE IN COVARIANCE DISLOCATION = CORRELATION X VOLATILITY

- Long forward = short covariance (sx5e vs EUR/USD)

- Therefore, quanto puts are **<u>long co-variance</u>**

$$F_{qto,t} = S_0 . e^{\left(r_f - r_d - \underbrace{\rho \sigma_{usd/eur} \sigma_{SX5E}}\right).t}$$

Covariance (SX5E, EUR/USD) =

Correlation (SX5E, EURUSD) x Var SX5E x Var EUR/USD

CORRELATION - SX5E/EURKRW CORREL @-46.5% VIA SYNTHETIC COVAR

Implementation: Choinomics vs. Draghinomics

The following structure enables investors to position long SX5E vs. EURKRW correlation (-46.5% offer, below all time realized)
- **Buy 1 Sep16 SX5E VarSwap compo KRW @23.45**
- **Sell 1.1 Sep16 SX5E VarSwap quanto KRW @26.35**
- **Sell 0.4 Sep16 EURKRW VarSwap quanto KRW @10.10**

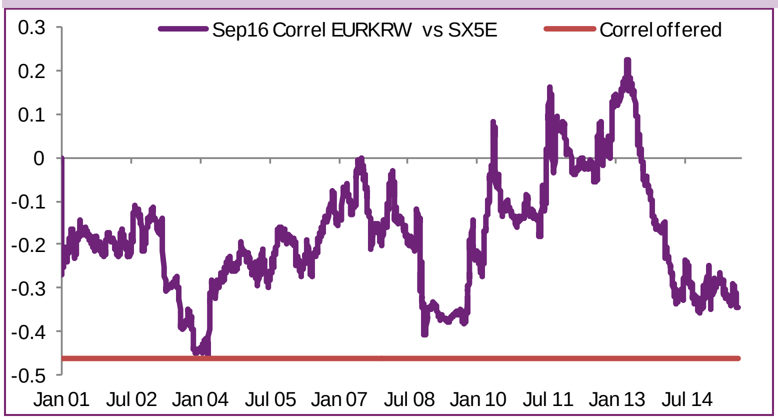
Investment thesis

While "Choinomics" (designed to boost credit growth and the housing market via monetary easing and deregulation) are still in place, **other catalysts could result in more KRW weakness relative to the EUR** than expected (as the latter already prices Draghinomics).

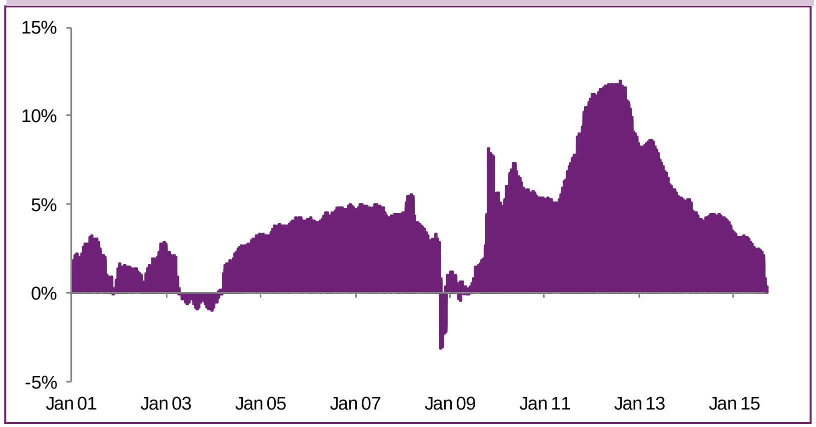
BoK's chief Lee Ju-Yeol acknowledged **a further reduction of the country's key interest rate may become necessary** depending on economic conditions, saying the current rate is not the lowest possible limit.
- Korea might face **capital outflows as the Fed enters its tightening cycle** throughout 2016
- China slowdown might **weigh on the Korean economy** and assets, the **KRW in particular**.

In Europe, we remain bullish equities and, though monetary easing should also weigh on the EUR, the downside should be limited as positioning is already very short. **Therefore, the odds of correlation between SX5E and EURKRW looks appealing, particularly given the implied levels.**

EURKRW vs. SX5E Correl at historical lows



Backtest: Synthetic SX5E vs. EURKRW Covar



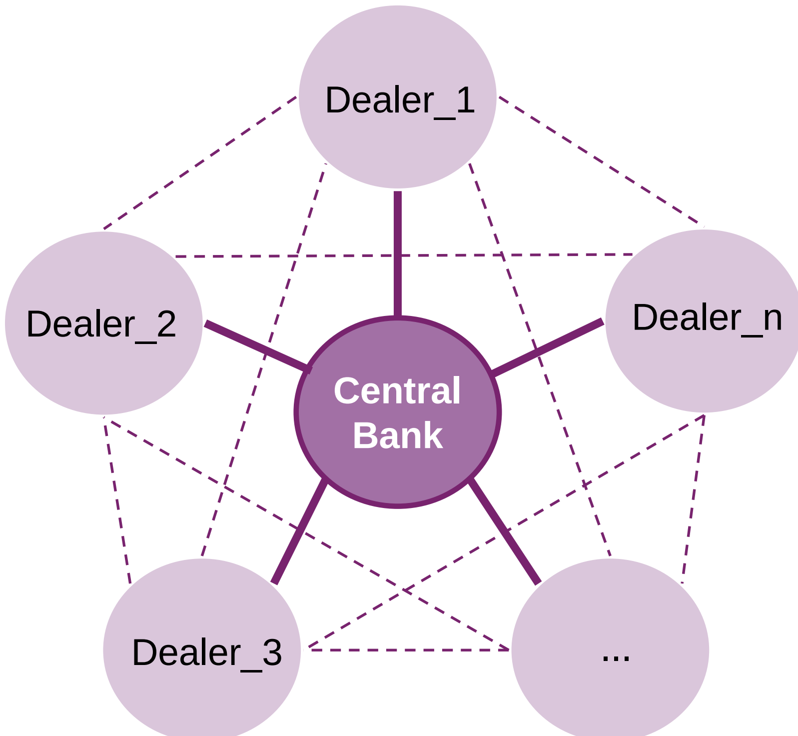
Source: SG CIB Flow Strategy & Solutions

LIQUIDITY DELUSION
CASE STUDY OF CREDIT MARKETS

Tight credit spreads, structural low liquidity

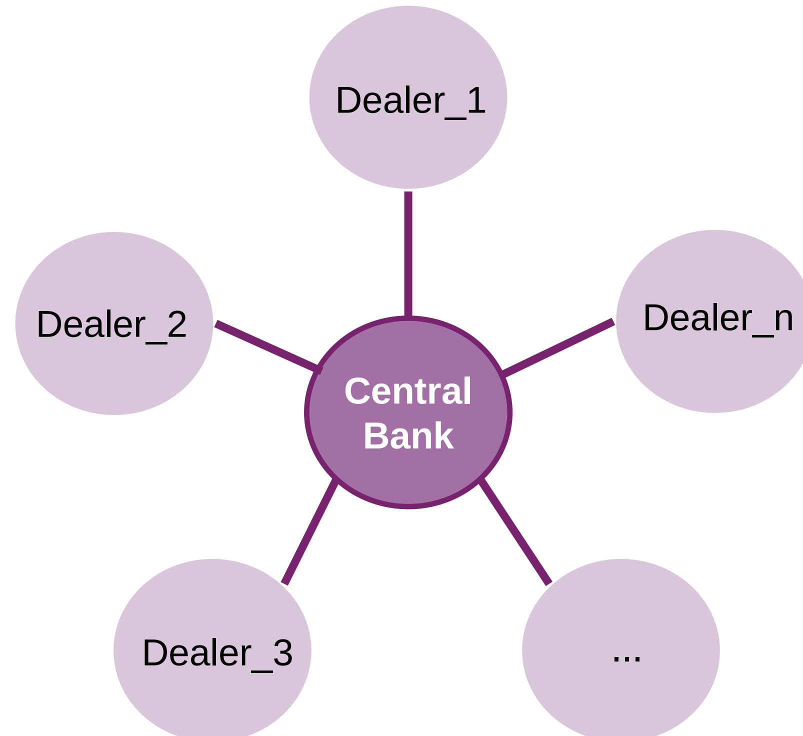
LIQUIDITY & ILLIQUIDITY CONVEXITY

Standard Segmentation: Optimal Liquidity



$\frac{n(n+1)}{2}$ edges ~ n^2

Segmentation in QE environment



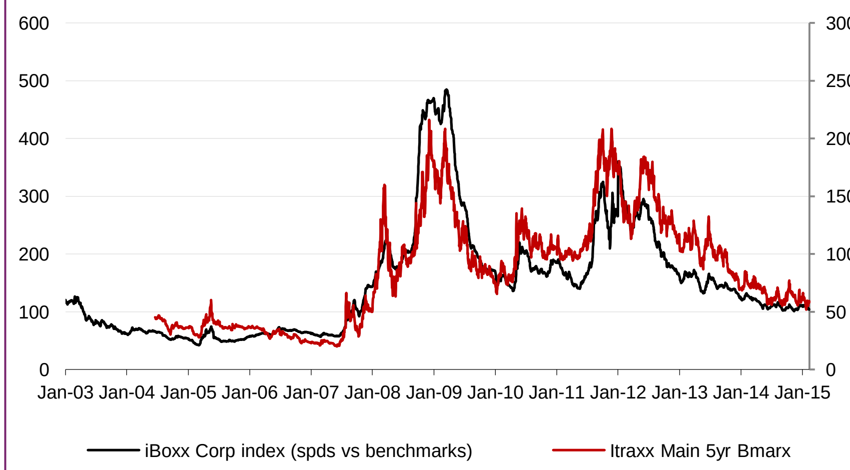
n edges

Source: SG CIB Flow Strategy & Solutions

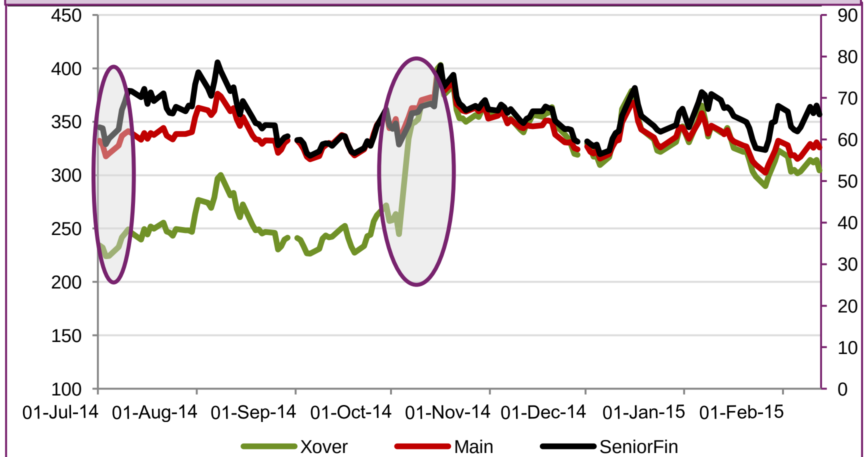
CREDIT SPREADS HAVE REACHED 2006 PRE-CRISIS LEVEL

- **Credit spreads keep tightening** reaching the lowest level we have seen since 2006, **driven by the ECB unconventional easing measures**
- Yet, there are a few key elements for a **possible sell off** or at least more volatility :
  - Eurozone economic recovery still weak, with still weaker economics for most companies
  - Grexit scenario
  - Uncertainty in Ukraine
- An idiosyncratic event could also lead to a **contagion risk** (Banco Espirito summer saga, Flash crash treasury in October, Bund future sell off in May 15...)
- There is an **increasing sentiment that risk is not correctly priced** in in Euro markets
- At current yields / spreads levels, one may **consider hedging / limiting its exposure to credit spreads**, which can be done :
  - Either through divestments on cash markets, which raises the question of potential reinvestments
  - Or through forwards or TRS, cash settled
  - Or through option –based strategies
- Whatever the solution chosen, a disinvestment strategy must be **built in advance**, as liquidity has become scarce on bond markets
  - **Scarce liquidity** might increase the magnitude of sell off movements
- Moreover; one may take advantage of the currently very low volatility

Iboxx IG and Itraxx credit spread



Zoom on July and October crisis

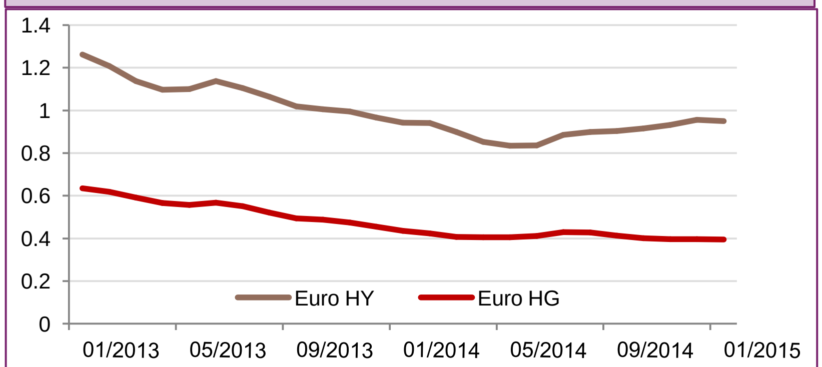


Sources : Markit

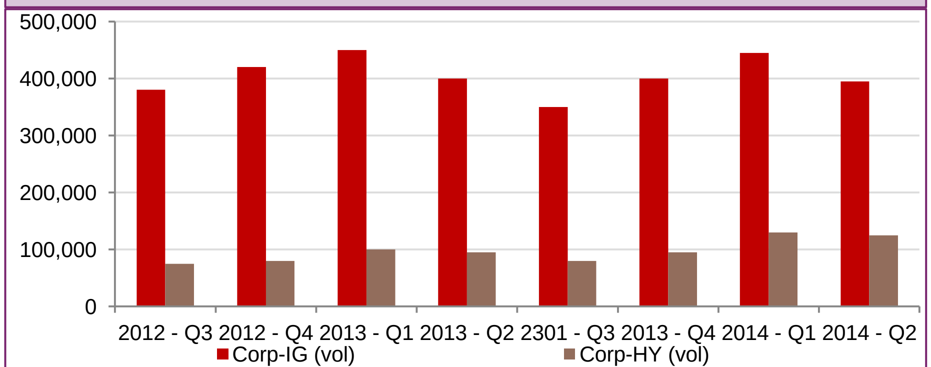
CASH CREDIT MARKETS : TIGHT SPREADS, BUT LOW LIQUIDITY

- **Liquidity on corporate bonds market is very low** with annual secondary market volumes representing only 0.1x the nominal outstanding, because of:
  - More **stringent capital charges for banks** driving them away from their initial market making activities as they become more capital intensive. Under Basel 2.5, capital charges have been multiplied by 2 to 4 for large positions held in trading books : as a consequence banks try to limit the "warehousing" of large books of credit and move towards a broker model
  - **Quest for yield** from real money investors with **a buy and hold, income objective**
    - Unconventional easing policies from Central banks are driving them away from government bonds
    - Strong incentive to keep existing bonds in the books for income
  - **Deleveraging efforts from many corporate issuers** which limit new issuance
  - Low liquidity on the repo market
  - Cyclical effect of the falling of volumes and volatility: larger cost for buy side and non profitable business for sell side
  - Move from cash bond exposure to ETF business
- The higher liquidity experienced between 2002 and 2007 was artificial, due to mispriced balance sheet and risk leading to an extension of leverage of fast money and development of structured products
- Further deterioration possible with MIFID II (pre and post transparency requirements) and CSDR (mandatory buy-ins)

MarketAxess Bid/Offer Spread Index (BASI)



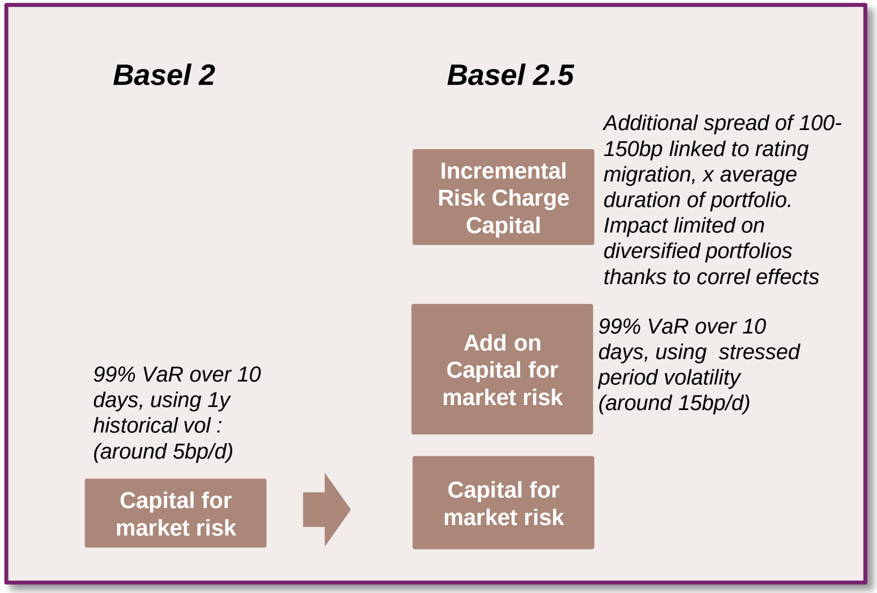
MarketAxess Bid/Offer Spread Index (BASI)*



CAPITAL CONSTRAINTS DRIVE BANKS AWAY FROM MARKET MAKING ACTIVITIES

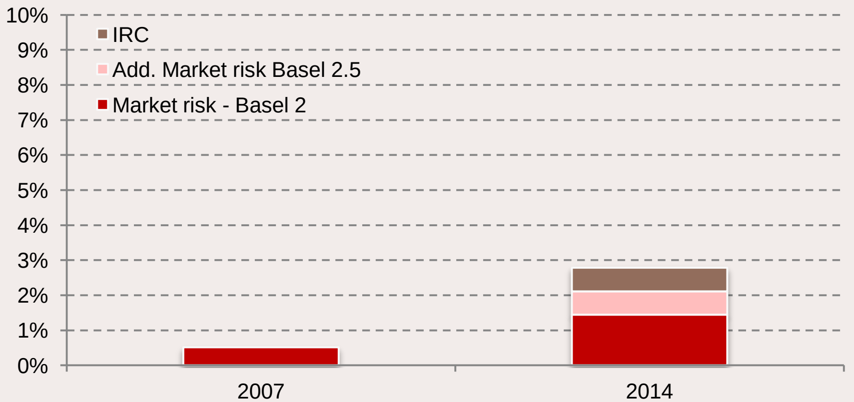
- **Basel 2.5 imposed 2 major changes to market risk capital charge**
- Stressed VaR : the capital charge for market risk must now be computed using a period of stressed market conditions for at least 25% of the statistical sample (vs a previous 1y 99% VaR at 10 days). **This increases the capital charge by a factor of 1.5 to 2.3 respectively for IG and HY corporate bonds.**
- **The Incremental Risk Charge (IRC) measures the rating migration risk**
- It is computed through a 99.9% VaR using probabilities based on historical occurrences of 1y rating migrations. For securities with a BBB rating, the likely result is a downgrade to BB, leading to an additional spread of 100-150bp, which can be mitigated thanks to diversification effects (leading to a net impact of 10-20% of gross impact)
- **All in, capital charges for large credit positions in trading book have been multiplied by an estimated 5 for IG and 2 for HY**

EVOLUTION OF CAPITAL CHARGE

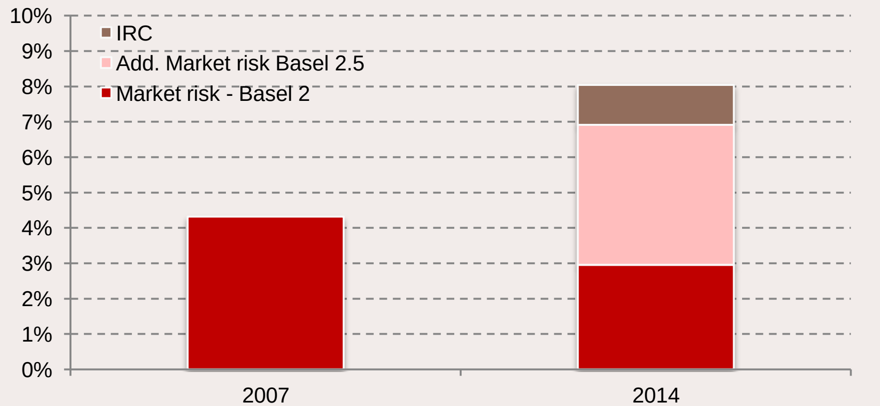


EVOLUTION OF CET1 + AT1 CAPITAL REQUIREMENT

INVESTMENT GRADE PORTFOLIO



HIGH YIELD PORTFOLIO

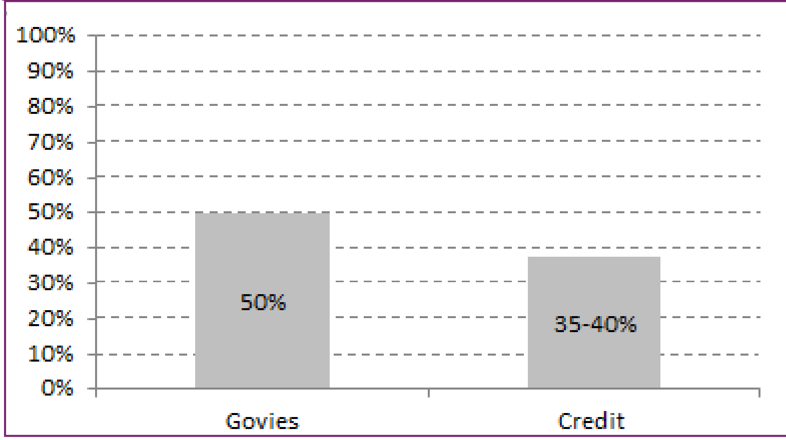


The analysis displayed is based on our understanding of the current regulatory rules and does not consist in an advisory proposal from Societe Generale
Sources : SG Global markets as of February 2015

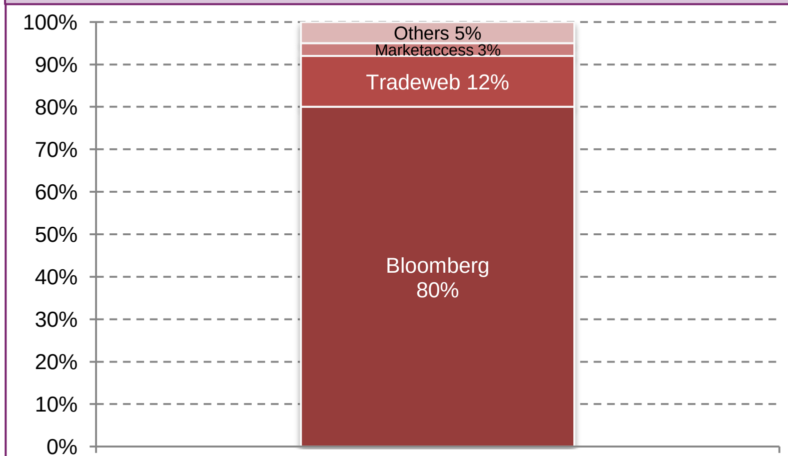
ELECTRONIC TRADING PLATFORMS DO NOT PROVIDE ADDITIONAL LIQUIDITY

- **As of today, electronic trading represents 35-40% of all volumes on corporate bonds' secondary market**
- **The electronic trading market is dominated by Bloomberg, followed by Tradeweb and Marketaccess, all of which being Dealer-to-Customer platforms**
  - As such, they do not bring additional liquidity
  - Moreover, tickets are small on electronic platforms (~500 kEUR), making it difficult to manage large positions
- Other types of platforms exist (or are being launched) :
  - All to all platforms (with anonymous transactions)
  - Interdealer platforms
  - Exchanges, such as EuroTLX. More retail oriented with tickets of 50 kEUR on average
- But as none of those platforms gather significant volumes so far, **the market remains essentially intermediated by dealers, whatever the distribution channel**
- Moreover, given the large number of platforms existing or being launched (23 on cash rates and 43 on cash credit), there is a risk that liquidity will be spread out to different places with even smaller ticket sizes

DEVELOPMENT OF ELECTRONIC TRADING



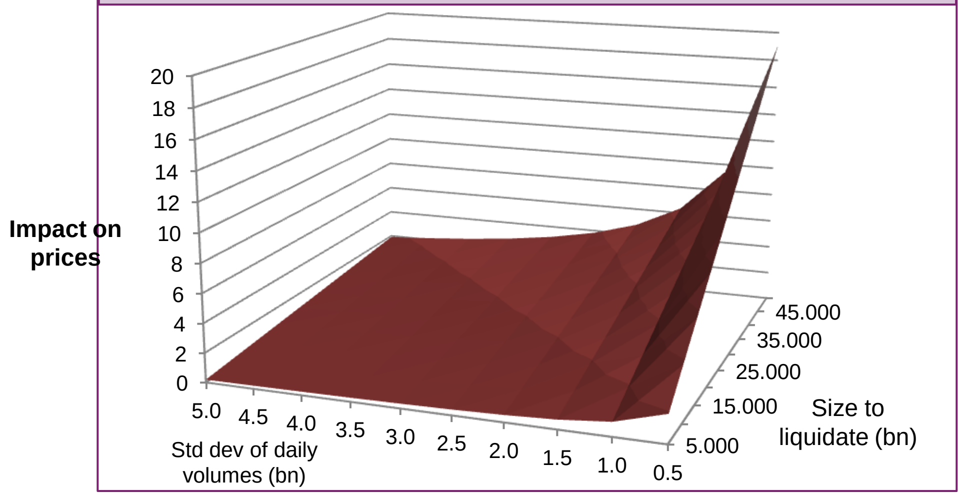
MARKET SHARES OF THE DIFFERENT ELECTRONIC PLATFORMS



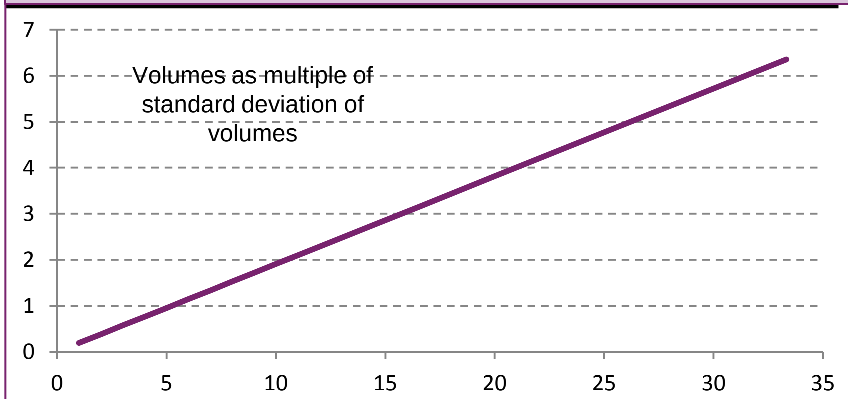
Sources : SG Global Markets – All figures on this slide are purely indicative and reflect the best understanding of the author as of Feb 28th 2015

THIN LIQUIDITY WILL AMPLIFY SELL-OFF MOVES

IMPACT OF LARGE SELL—OFFS ON PRICES – INDICATIVE MODELIZATION



PRICE IMPACT SHOULD BE A FUNCTION OF THE VOLUME SOLD DIVIDED BY STANDARD DEVIATION OF DAILY VOLUMES



BACKGROUND

- Based on theoretical work from R. Kissel and R. Malamut (2005)
- We model the price drift as follows :
- **Δ P / P = Scaling factor x σ x (Volume / Std Dev of daily Volume)**
- Qualitatively, one may consider that :
- Orders larger than the usual standard deviation of daily volumes are likely to be difficult to handle and shall generate a significant price movement
- The amplitude of the price move relative to the volatility of prices should be proportional to the amplitude of the volume sold compared to standard deviation of daily volumes
- Which leads us to the above formula, with a scaling factor depending on the asset class characteristics (capability of market to absorb large volumes)
  - In our calibration, scaling factor is < 1
- In our view, excluding holidays / issuance days, the std dev of daily volumes on Corporate bonds should be of € 0.1 – 0.5 bn (on an index basket, obv. much lower on individual names)

Sources : SG Global Markets, R Kissel / R Malamut

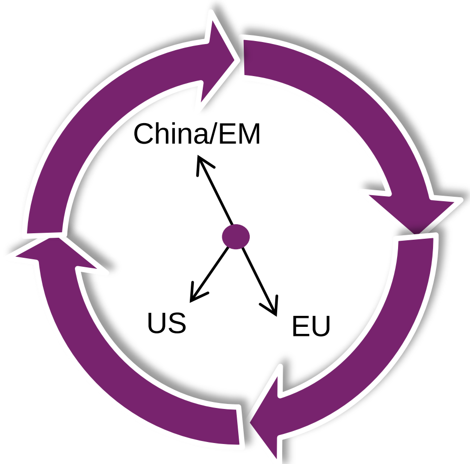
THE CLOCK IS TICKING .... THANK YOU !

Cycle/Time is passing by at a pace dictated by central banks' monetary policies

= Einstein's theory of relativity and **Space/Time continuum**

Deleveraging
Credit ↑ Equity ↓
Volatility ↓ Skew ↑
Vol of Vol ↑

Debt Crisis
Credit ↓
Equity ↓
Volatility ↑
Skew ↑
Vol of Vol ↑



Co-Recovery
Credit ↑
Equity ↑
Volatility ↓
Skew ↓
Vol of Vol ↓

Re-leveraging
Credit ↓ Equity ↑
←Volatility→ ←Skew →
Vol of Vol ↑

Source: SG CIB Flow Strategy & Solutions

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The products discussed herein include a risk of capital loss. In a worst case scenario, the counterparty could sustain potentially unlimited losses.

Credit risk: Entering into the transactions discussed herein creates a credit risk on the counterparty i.e. the counterparty's insolvency may notably result in the partial or total loss of the invested amount (if any).

Market risk: The product may at any time be subject to significant price movement, which may in certain cases lead to the loss of the entire amount invested, if any (e.g. premium), and in a worst case scenario, to unlimited losses.

The fluctuations in the marked-to-market value of the products discussed herein may require the counterparty to pay margin calls, make provisions or resell the products in whole or in part before maturity, in order to enable the counterparty to comply with its contractual or regulatory obligations. As a consequence, the counterparty may have to liquidate the products under unfavourable market conditions, which may notably result in the partial or total loss of the invested amount (if any). This risk will be even higher if the products include leverage. Certain exceptional market circumstances may have a negative effect on the liquidity of the products discussed herein, and even render the products entirely illiquid, which may make it impossible to withdraw from the products and result notably in the partial or total loss of the invested amount (if any).

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