Key considerations of efficient hedging strategies

Volatility and Tail Risk Educational Breakfast

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Arnaud Fortier, Investment Management

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Market structures have changed

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- Dealers inventory (i.e. risk warehousing capacity) is diminishing

- The massive amounts of QE provided by the major central banks since 2008 has engendered one of the greatest bull markets. Asset managers and non-bank investors have increased exposures to risky assets, driving down the cost of credit and likely under-pricing the risk they are accepting- **Monetary policy dominates investor behaviour**

- The unprecedented level of global debt has created vulnerabilities

- Impact of some ETF products to the market further exacerbates imbalances between supply and demand (i.e. vol of vol of Volatility index)

- **From a market perspective, the likelihood of gap risk amongst risky assets has increased**

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Assets Inventory – what tools are at our disposal?

Focus on the risk inventory that can be quickly shifted based on tested experience

- Core assets / Cash securities
  - Focus on Developed Markets Equities and Government & Government Guaranteed
  - Credit market is expected to **not** be sufficiently liquid based on experience, but can provide some manoeuvrability if actions are sufficiently anticipatory in specific sectors

- Derivatives
  - Linear and option based strategies dominate cash solutions and hence are preferred for speed and rapid build up
  - On an opportunistic basis, derivatives can act as a bridge solution to cash based solutions (i.e. credit)
  - Gap risk calls for increased convexity providing tools. Basis risk will emerge

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Derivatives – powerful convexity tool

Three drivers on instrument choice: liquidity, correlation to hedged assets and cost versus convexity

Sectors	Dominant economic exposure	Highlights
Equity valuation **DM mostly**	Protection against a drop in a market price. Downside participation is a function of the level of the protection i.e. Strike Directional position on equity price and moderate exposure to equity volatility (varying with both level and tenor of the protection)	**Focus only on Blue chip indices** Sectorial indices (like banks) are more expensive and are not available in size **Highly liquid (++++) and positive cross effects with credit spread risk**
Equity volatility **DM only**	Exposure to the spread between future realized volatility and current implied volatility Variance swap, forward variance swap	**Focus on US volatility index and core markets for variance products** **Liquid (+++) and positive cross effects with credit spread risk**
Equity Dividend **DM only**	Exposure to expected dividend over time	**Focus on dividend indices (Europe mainly)** **Liquid (+) and positive cross effects with credit spread risk**
Credit Spread **DM only**	Credit Spread options - Exposure on a spread widening movement on IG credit and exposure on spread volatility Credit Spread Indices (IG)	**Non linear strategy - generally liquid up to 6 months but shows technical gaps in the market (hence timing is key)** **Limited market capacity (+)** **Linear Product – liquid but market can quickly shift to one way (++)**
Exchange Rate **Core only**	Currency valuation (depreciation / appreciation)	**Highly liquid (++++)**

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Key principles of efficient hedging strategies

- Identification of the undesired risks
- Estimate the target drawdowns and timing of the events
- Markets and relevant indices
- Sizing the hedging Budgets (how much premium / budget should be spent and for what notional?) Cross asset strategies will bring basis risk that needs to be quantified and monitored
- Choosing the ideal hedging strategy – aligning hedge payoff to the view on the risk development based on a cost benefits analysis
- In house implementation requires **pricing capabilities** for execution and frequent dialogues with banks
- ***Exante* portfolio management rules** (management of the way out as opposed to a buy and hold strategy)

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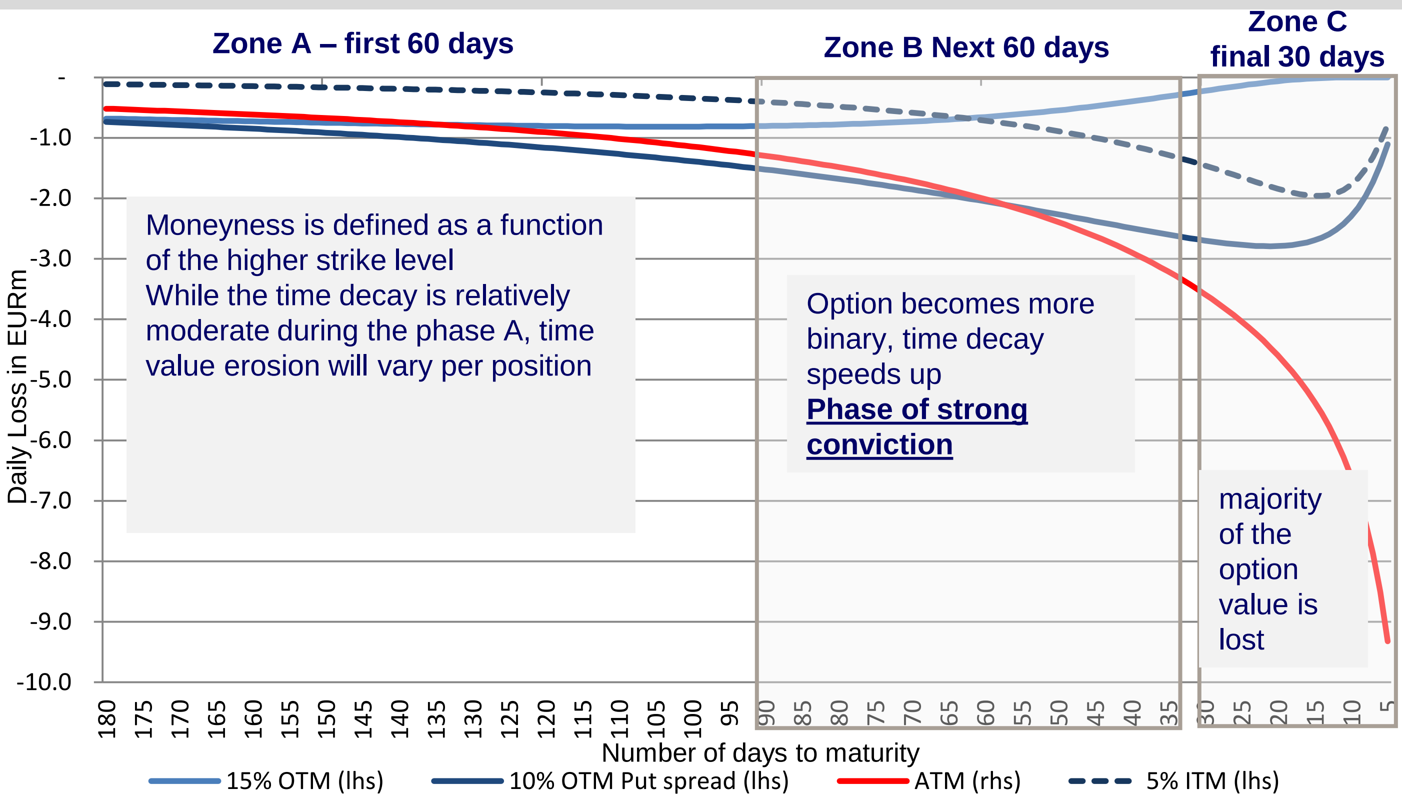
Time—Residual maturity does not represent the sole factor impacting the theta of the position

Size of the theta is closely connected to the time value hence option moneyness is key

Monetary Theta (daily) of put spreads over the residual maturity EURm



Assumptions

Moneyness of the upper strike

15% OTM : Underlying did not move, upper strike is still 15% OTM

10% OTM: Underlying moves down by 5%

ATM: Underlying moves down by 15%

5% ITM: Underlying moves down by 20%

- Option loses value at the start of its life time and this process speeds up as expiry approaches
- ATM position exhibits the highest decay profile as ATM position shows the maximum time value where the difference between a worthless position and a profitable position is the biggest

Source: Investment Management, Bloomberg

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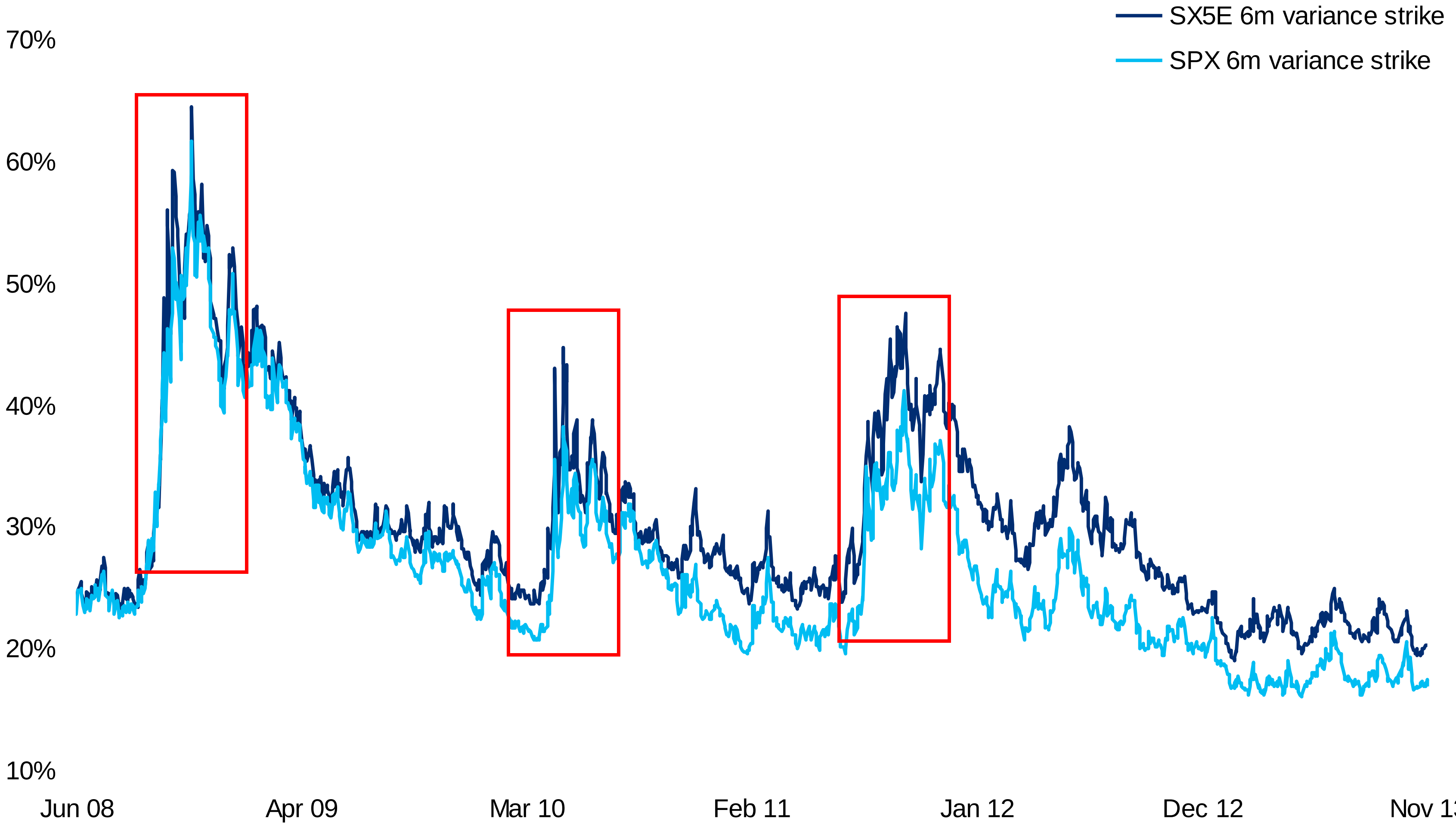
Pure variance strategies need very precise timing—i.e., strong directional conviction at the time of entering into the transaction

Characteristics of Variance / volatility strategies



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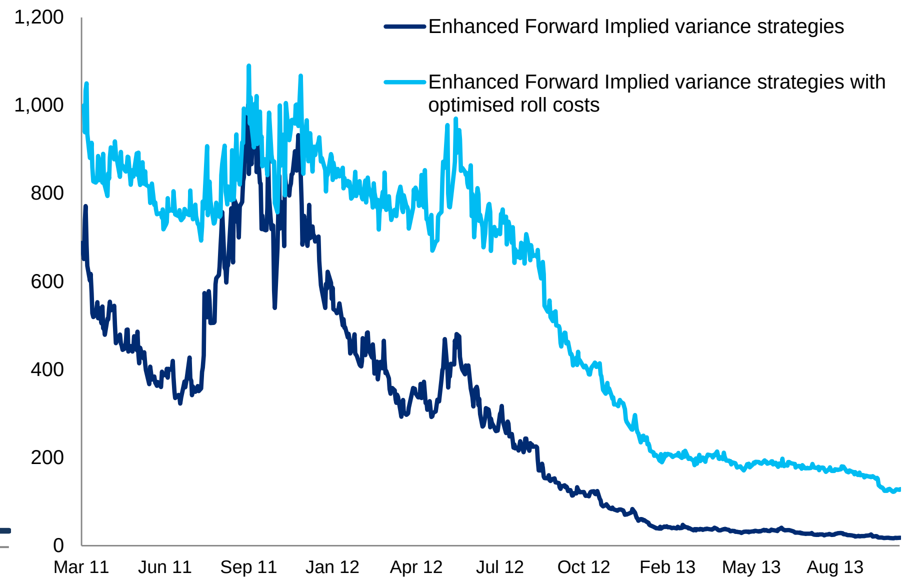
Source: Investment Management, Bloomberg

Roll of systematic / naive tail risk strategies shows prohibitive decay

Both approaches suffer from a strong negative carry, once rolled systematically

Cumulative performance of 1yr OTM put

MTM of forward implied variance strategies



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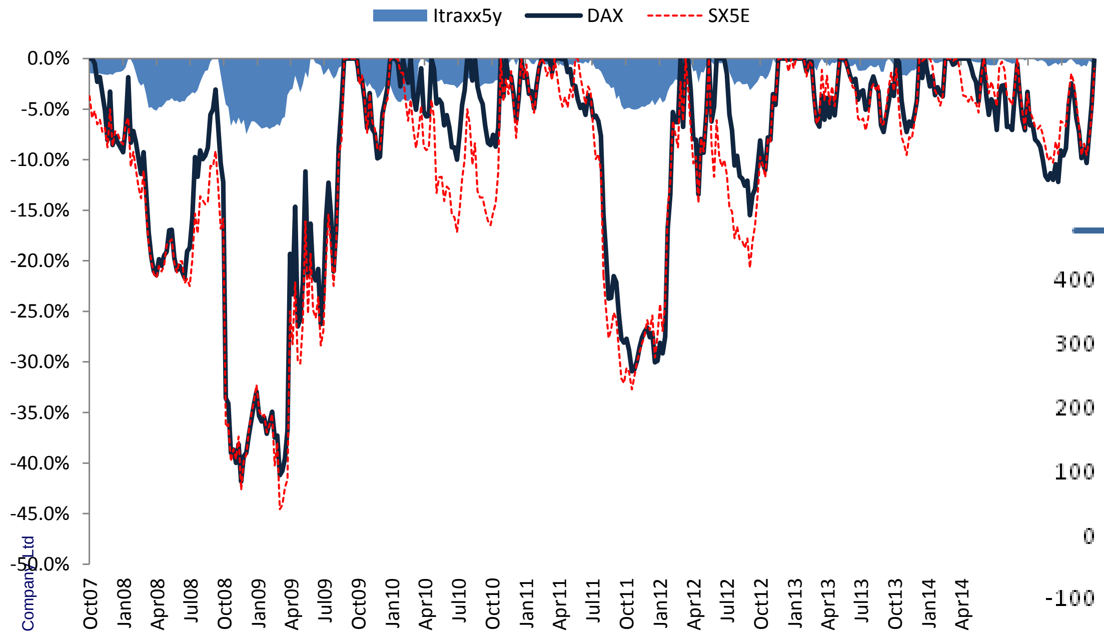
Source: Investment Management, Bloomberg
Tail risk strategies based on the purchase of 1yr 80%OTM put options rolled on an annual basis

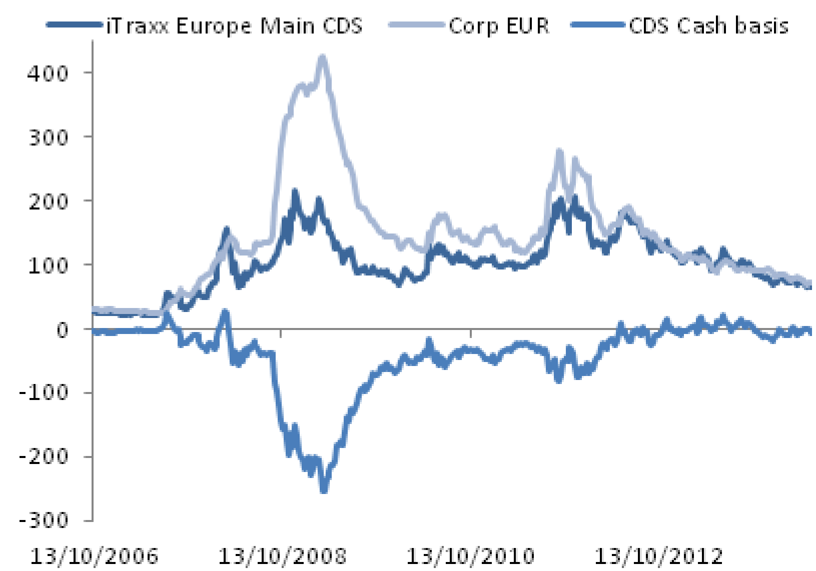
Positive cross effects - Equity factors as a proxy hedge for credit spread risk

whilst credit and equity drawdowns seem to be well synchronized, drawdowns in the equity market can be more volatile/lag and differ in magnitude, specially amplified during big market disruptions (2008 and 2011)

Historical 6months rolling drawdowns



CDS – CASH Basis



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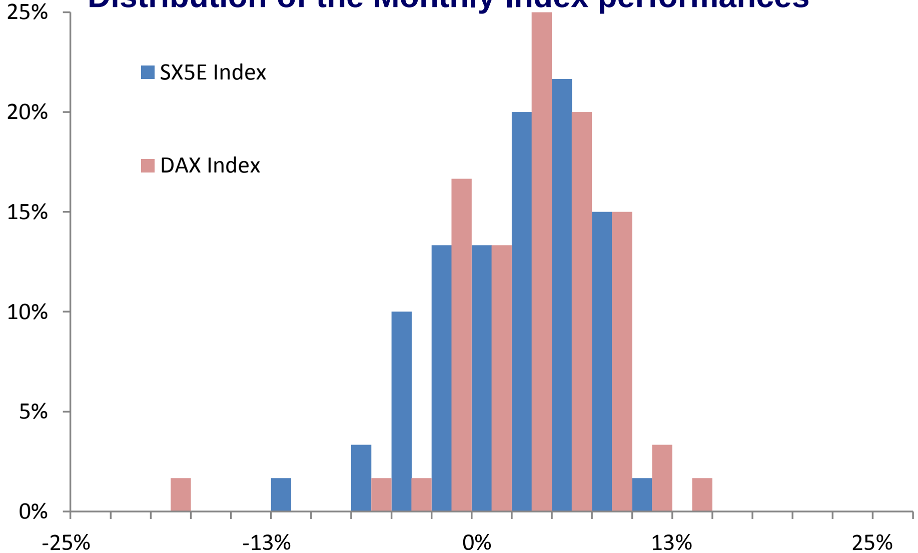
Source: Investment Management, Bloomberg

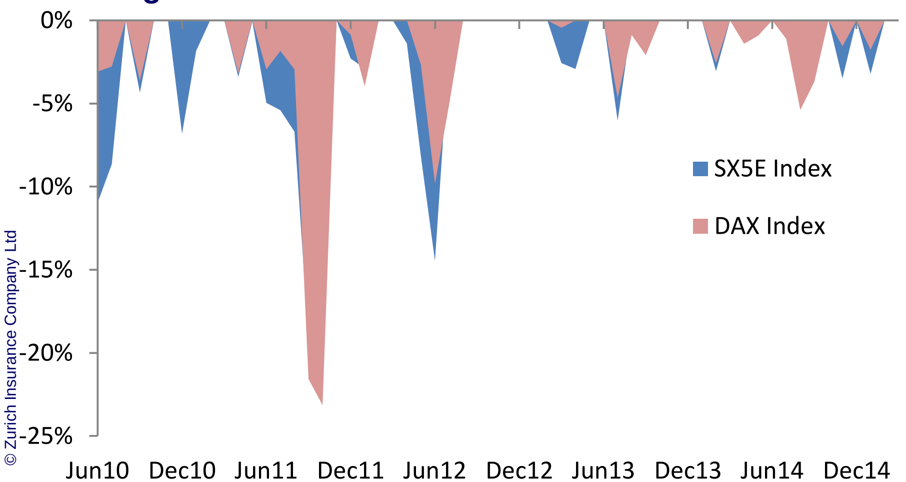
Avoid determining optimal tenor and strike by regulatory or in – house risk management requirements

Distribution of the Monthly Index performances



- Looking at past equity performance to assess the extent and pace of declines in bear markets
- The maximum drawdown helps to assess the potential downside intensity for various market declines and hence, potential strike levels

Rolling 3months Maximum Drawdown



Recent large Tail moves over the Eurozone crisis

Index	Start	Time (months)	Market drop
SX5E	Aug11	3	-19.18%
SX5E	May12	1	-14.47%
SX5E	May10	2	-8.65%
DAX	Aug11	2	-23.14%
DAX	May12	1	-9.82%

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Source: Investment Management, Bloomberg

2015 market developments– macro hedge strategies based on DAX and/or Eurostoxx 50 were the ideal candidates

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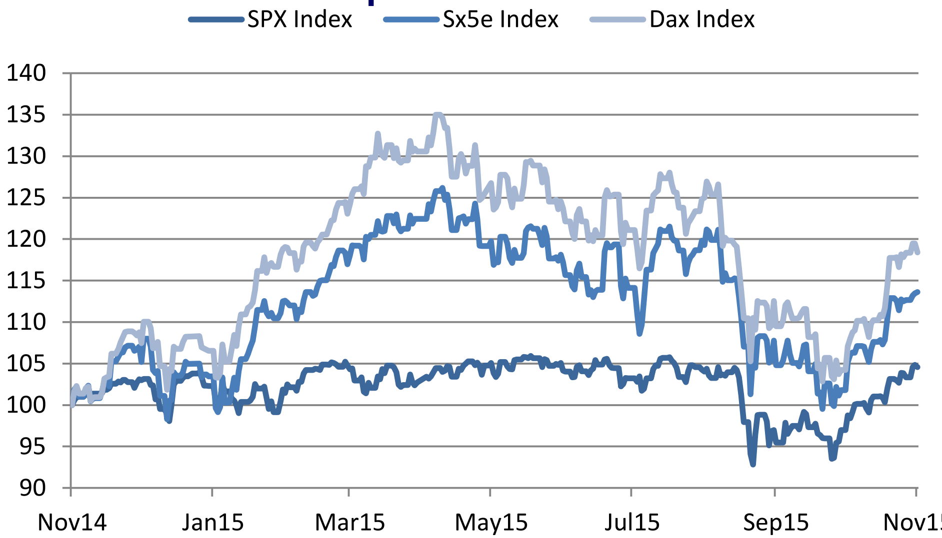
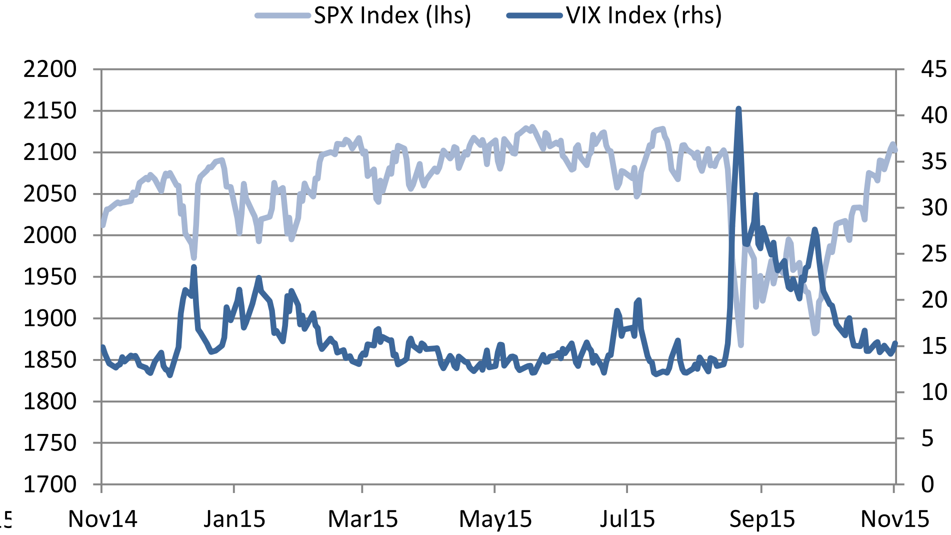
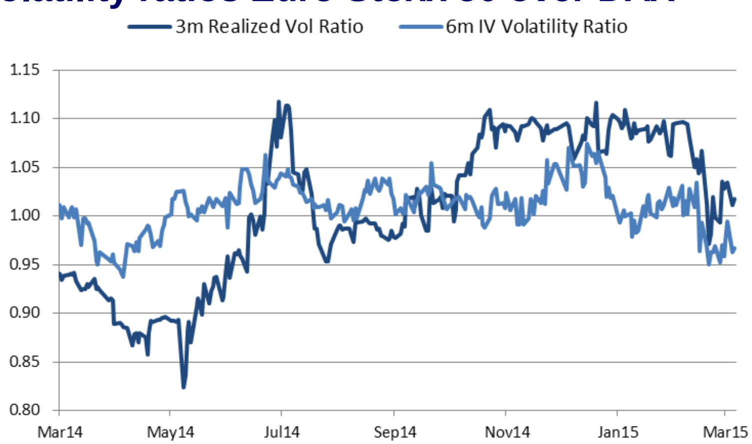
Normalized Index performances



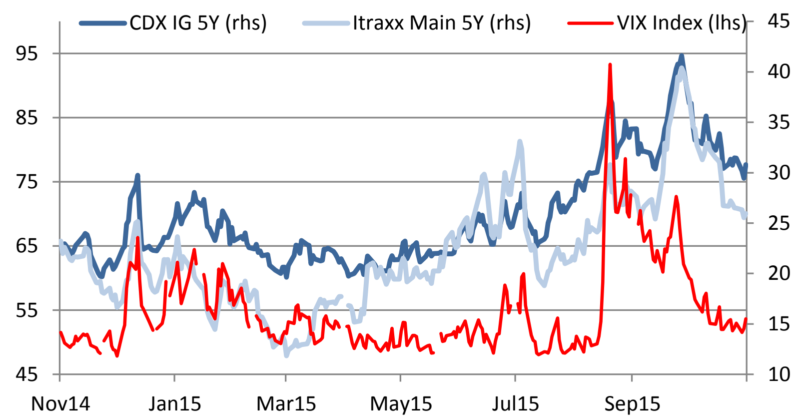
SPX Index / Vix Index



Volatility ratios Euro Stoxx 50 over DAX



Cross assets developments



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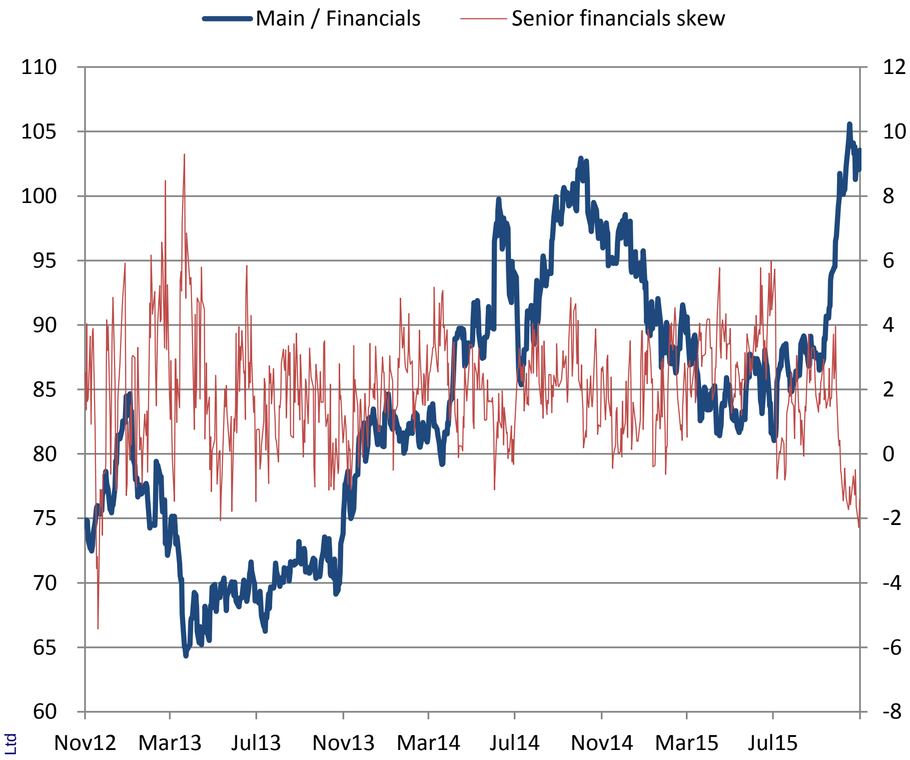
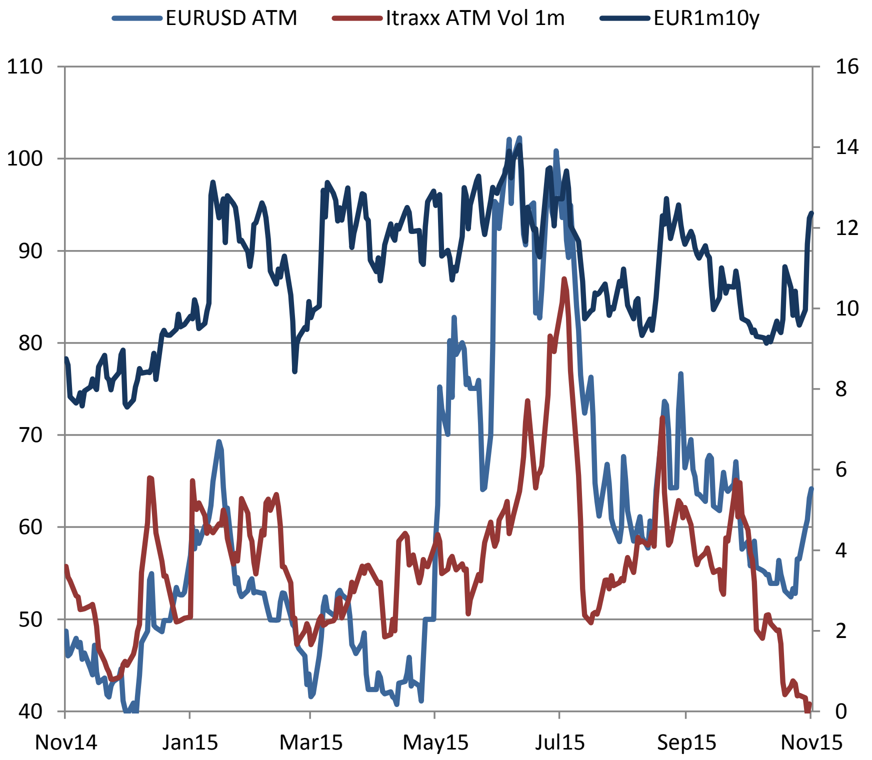
What’s next

ECB action and impact on Financials



Cross assets developments



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