SYSTEMIC RISK

Market functioning and resilience

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Deutsche Bank

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tomorrow is today

‘RESILIENCE’ OF MARKETS

- Three main factors are impacting market resilience

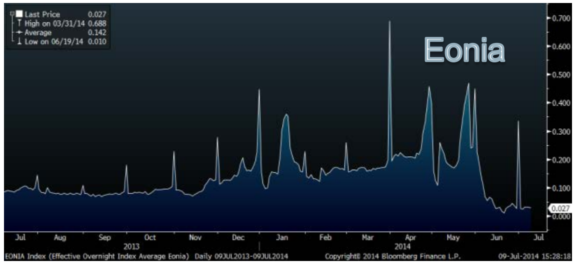
    1. Diversity of market participants
    2. Liquidity of markets
    3. Procyclical behavior

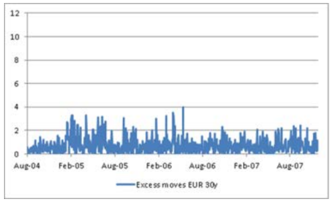
DIVERSITY OF MARKET PARTICIPANTS

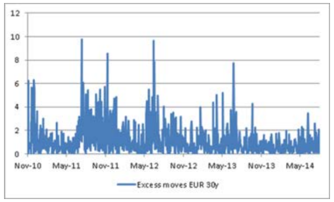
- Market makers (Banks)
    - Positions adjust as flows make securities rich/cheap. Reduced balance sheet capacity. Vol sensitivity in risk measures (VaR)
- Fast Money
    - Prop desks largely gone. Hedge funds and Asset Managers are constrained by lack of exit possibilities.
- Buy & Hold or fundamental long-term investors
    - Constrained by counterparty and leverage availability. Regulated entities in this segment are behaving more procyclically.
- Government money
    - Last resort – when government intervention needed, the damage is already done.

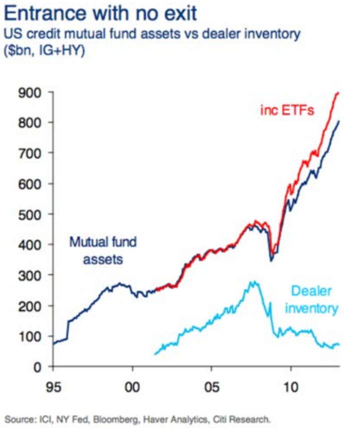
LIQUIDITY OF MARKETS

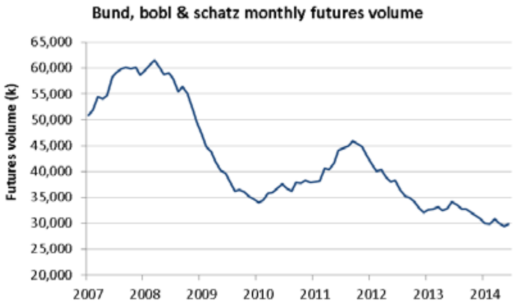
- Liquidity of (bond) markets impacted negatively by regulation
  - RWA
  - Leverage ratio
  - LCR / NSFR











PRO CYCLICAL BEHAVIOR

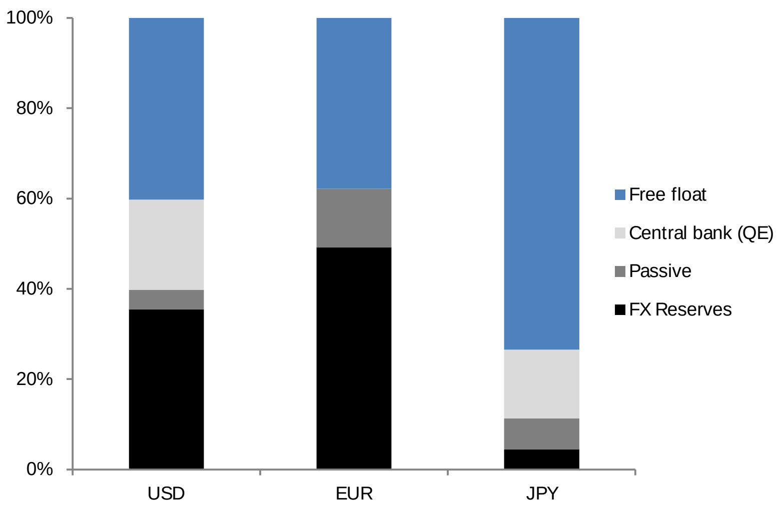
- Clearing and margining
  - High quality assets – clearing members' discretion to increase margins
- Pension & Insurance regulation
  - Regulatory framework is risk based and as a consequence pro-cyclical ?
- Underestimation of liquidity requirements
- 'Search for Yield' and the role of QE

CONCLUSION & ITEMS FOR DISCUSSION

- Bond markets are less resilient to shocks - caused by a diverse set of factors that are related and reinforcing
    - Reduced diversity of market participants
    - Reduced liquidity
    - Pro cyclical behavior – mandatory and voluntarily
- Does the group agree with this conclusion ?
- Do insurers suffer from a similar problem as (Dutch) pension funds ?
- Do insurers and pension funds have to change their asset mix when volatility increases ?
- Did Solvency II add to pro-cyclicality of markets ?
- Is this a temporary issue or structural ?
- Do the participants of the BMCG see possible solutions ?

The Bund Conundrum

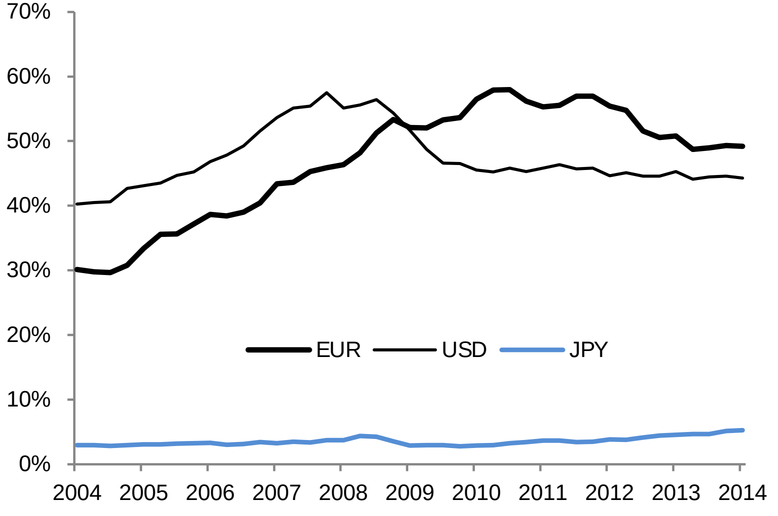
There is no such thing as a free market



- Assets held by price-insensitive investors (central banks and passive trackers) are so large that the free float of high-quality bonds is much smaller than the outstanding amount (around 38%)
- This makes it impossible for investors to hold 'the market portfolio' in high-quality USD and EUR bonds
- Unlike the US and Japan, the ECB is (still?) passive in this process
- Main driver of squeeze on AAA EUR is FX reserve holdings and a large proportion of passive investments

Source: IMF (COFER), Eurex, BrokerTec, BoJ, FRB, DBIQ, GPIF, PFA, DB calculations

Deficits are a slow remedy



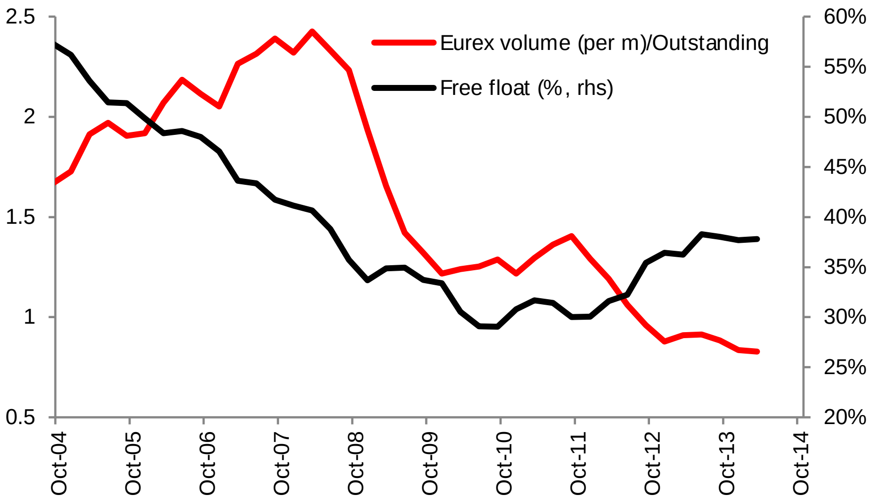
- High public deficits alleviate the short squeeze, for EUR disinvestment has also been helpful
- The problem is bond indices: there is no free-float adjustment in how these are constructed (unlike equity)
- In EUR, the asymmetry in participation between core and non-core market leads to a distortion in cross-country spreads
- Investors are structurally short core and long non-core

Source: IMF (COFER), DBIQ, DB calculations

Index methodology is creating problems

- In equity indices, it is quite common to reflect immobile long-term holdings in listed shares through free-float adjustments
- For fixed income indices, that is not possible because no holding data is publicly available
- This means, however, that investors trying to follow a benchmark chase an asset allocation that may not be available in the market
- As investors become aware of the shortage in some market segments, liquidity drops even more as relative value trading declines
- In effect, bond markets are not prepared for systematic distortions in supply
- Whether regulatory drivers for collateral (clearing, LCR) is hard to delineate from the COFER data analysis because the target market segment is the same (high credit rating, low duration)

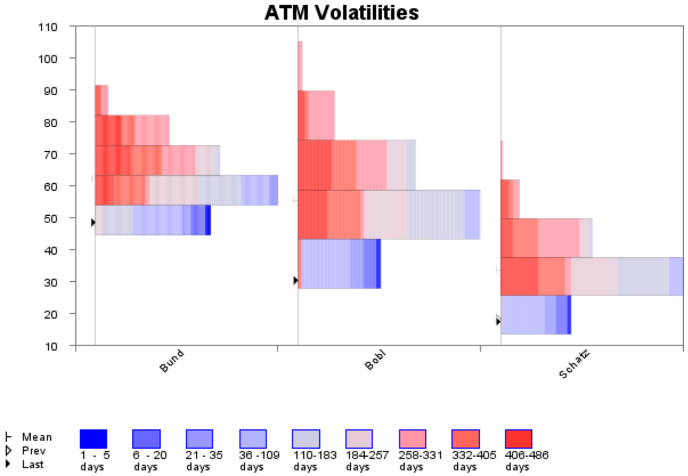
Some other factors also seem to be at work

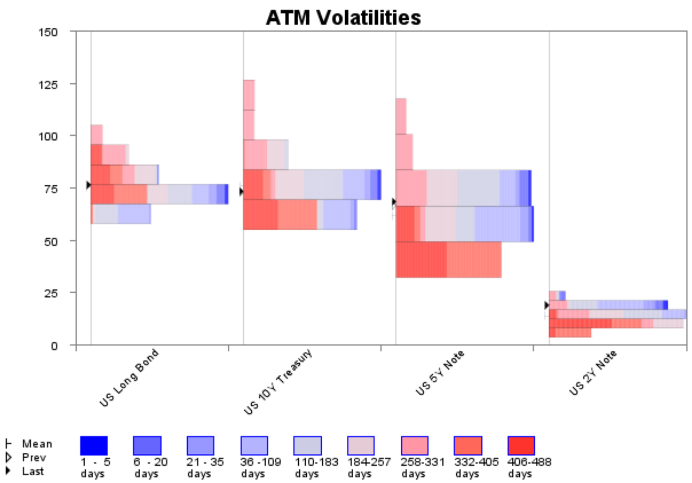


- Eurex volumes relative to outstanding AAA debt are at lower point than post Lehman
- That said, retreat of reserves from EUR should have freed up some liquidity
- It is likely that adoption of Basel III in 2011 and crisis-related losses added to the loss of liquidity
- Impossible to quantify is the positive feedback effect between liquidity and volumes

Source: IMF (COFER), Eurex, DBIQ, DB calculations

Food stamps for yield-starved investors: Option overlays

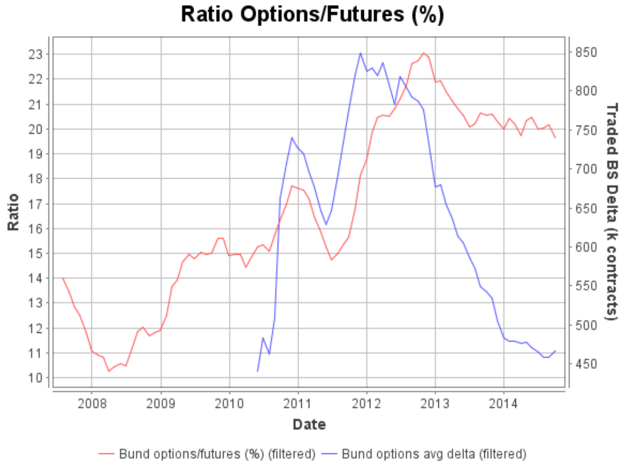


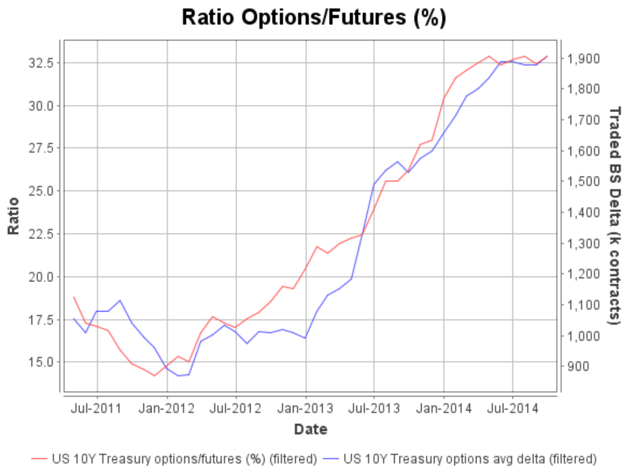


Source: Eurex, CBOT, price date 10 October

- EUR implied volatility levels tend to be extremely low and not reflective of risks, USD 50% higher and more realistic
- Option selling in EUR now more focused on ATM (1:1 call spreads)
- CBOT options have reached 24% of futures volumes, unlikely that the liquidity risk is reflected in pricing
- Cf Jan/Feb rally in Bobl which was emphasised by short call overlays
- Last week's move probably also hurt overlay sellers

Underlying futures volumes do not support gamma scalping





Source: Eurex, CBOT

- Selling of options in overlay strategies is not a problem if there is enough liquidity in the underlying future to close delta risk quickly when required
- The problem is that options volumes are now larger compared to volumes in the underlying futures
- In times of stress, it is unlikely that delta risk can be fully controlled because underlying liquidity is not there
- A separate (but related) risk is that implied volatility is not offering a meaningful premium over realised so overlays do not make money systematically

Issues for discussion II

- Nominal AAA yields are probably distorted downwards
- Purchases of government bonds would distort core markets yields more than periphery
- Potential remedy: include government guaranteed debt
- Corollary: Break-even inflation is possibly distorted downwards and not a good indicator for inflation expectations
- Indeed, massive purchases of nominal bonds could even lower breakeven inflation
- Should ECB buy inflation-linked bonds as part of QE? If so, at what breakeven level?

Appendix 1
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